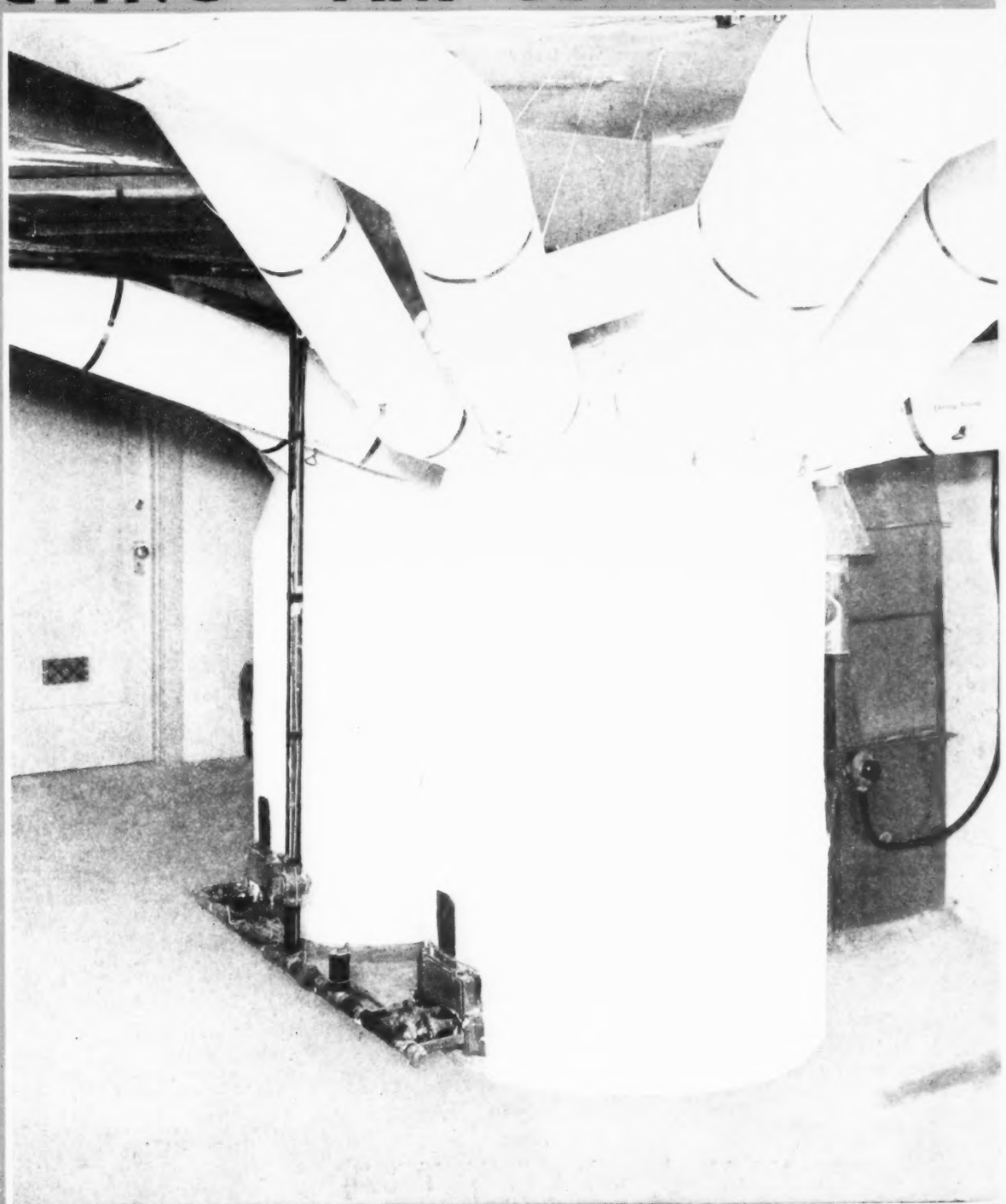
AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING



ESTABLISHED 1880

AUGUST, 1932

"Easy to sell them Copper when you *explain its advantages*"

Say this to your next customer: *"Copper will save you far more than its slightly higher first cost."* Sell the savings of durable metal

MOST of your customers are familiar with these two facts: that metal that rusts will some day cause expense; and, that Copper *cannot* rust. A great majority of them will readily pay a fair price for Copper, when they appreciate that the cost of one repair of rusted-out metal work can easily amount to far more than the extra first cost of durable Anaconda Copper.

By explaining these facts, many contractors are selling Copper more easily today than ever before...and are enjoying a worthwhile increase in profit per job. Why not try to sell your next customer? Tell him that Copper will save far more than its slightly higher first cost. And, when you talk Copper, don't overlook the value to you of the public acceptance of the name Anaconda.

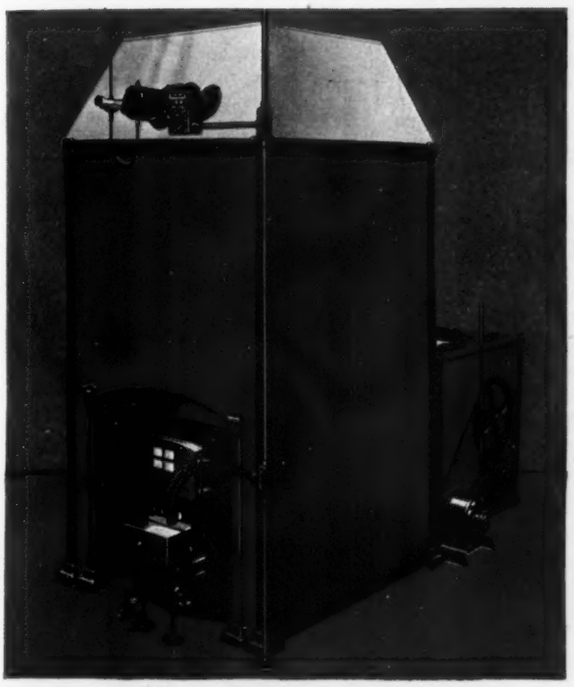
Leading sheet metal supply houses carry Anaconda Copper...backed by the industry's best known name...in sheets, rolls and Economy strips, and Copper gutters, leaders, elbows and shoes trade-marked ANACONDA. The American Brass Company, General Offices: Waterbury, Connecticut.

ANACONDA
from mine to consumer

ANACONDA COPPER

EASY TO SELL . . . PARTICULARLY NOW!

MW "Automatic Weather Control Units"---Autumn Sales Maker for Dealers Handling Complete Line of MW Oil Burning Utilities



Evenings are getting cooler. Time to think of doing something about that worn-out warm-air heating plant downstairs!

Just the right season to interest some owners in the famous dual-duty MW "Automatic Weather Control Unit"—which in Winter *heats* the premises with marvelous efficiency, without the bother of coal, ashes, dust, fumes—and, with like efficiency, *cools and ventilates* them in Summer. It gives this year-round service with an economy that makes each installed unit sell others in the dealer's community.

Spring, Summer, Fall, Winter, the selling of MW Oil-Burning Utilities—"Automatic Weather Control Units", Automatic Boiler Units for Steam and Hot-Water Heating, Automatic Water Heaters, Oil-Burning Ranges—is a profitable business.

The coupon below will bring full information about the MW line on which dealers are sure to realize satisfactory profits this Fall and Winter.

MW

OIL BURNING ● AUTOMATIC WEATHER CONTROL UNITS

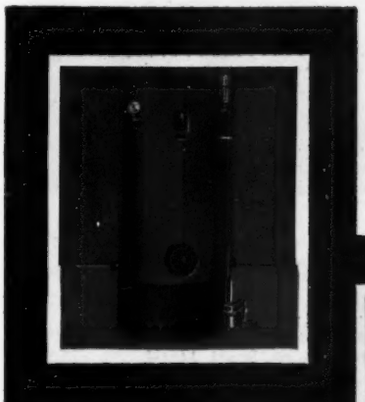
PRODUCTS THAT SELL SPRING, SUMMER, FALL AND WINTER

MW OIL-BURNING COOKING RANGES

Two types—for homes, restaurants, lunch rooms, roadside stands, hotels, clubs, etc. Quick, clean, uniform, controlled heat—the better, more economical way of cooking, frying, roasting, baking.

MW AUTOMATIC WATER HEATERS

Domestic and commercial sizes. For homes, apartments, office buildings, schools, shops, laundries, factories. Single and battery installations. Hot water at lowest cost. Listed as Standard by Underwriters' Laboratories.



MW AUTOMATIC BOILER UNITS

For steam or hot water heating. Incorporate the amazing oil-burner development—the new, super-efficient MW Gyro-Flame Burner. Large and small capacities.—Listed as Standard by Underwriters' Laboratories.

MW "AUTOMATIC WEATHER CONTROL UNIT"

Round type, for greatest space saving. Operating efficiency and economy identical with square type shown above. Heats in Winter, cools in Summer—automatically. Listed as Standard by Underwriters' Laboratories.

MOTOR WHEEL CORPORATION, DEPT. A-8
HEATER DIVISION, LANSING, MICH.

Please send me full information describing the MW line of oil-burning utilities, and explaining its sales and profit opportunities.

Name.....

Address.....

City.....*State*.....

Covering All Activities
in
Gravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Merchandising
Ventilating

AMERICAN ARTISAN

Founded 1880

VOL. 101 ▼ No. 14

AUGUST, 1932

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The Bank of America and L. Scatena Buildings, San Francisco. • H. A. Minton, Architect. Morrison & Co., Sheet Metal Contractors

In two of the most prominent office structures in San Francisco, The Bank of America and L. Scatena Buildings, Toncan Iron plays an important role. To insure permanence all top cornices, awning boxes, and sign panels are made of Toncan Iron.

Toncan Iron is a modern alloy. It is scientifically refined iron alloyed with copper and molybdenum. It is long lasting because extra life in service is processed into every grain of the metal.

Among the ferrous metals it ranks first in its resistance to corrosion after the stainless irons and steels.

To installations it brings economy. To the sheet metal contractor it brings profits, because it can be sold for more and because it can be worked more easily and at lower cost.

"The Path to Permanence" illustrates and describes hundreds of uses to which this most applicable of sheet metals can be put. Write for a copy today—it will give you a new slant on the very interesting subject of building business through good will.

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

Now Inland Quality Inland Service in *STRIP and HIGH FINISHED SHEETS*

To steel buyers of the Central West the New Inland Strip Mill means more than the mere fact that another mill has been built. It means that the same quality and service Inland has always maintained on "bread and butter" grades of sheet steel is now available in a more complete list of products including:

Hot and Cold Rolled Strip
Furniture Sheets
Auto Body Sheets
and all other High Finished Sheets

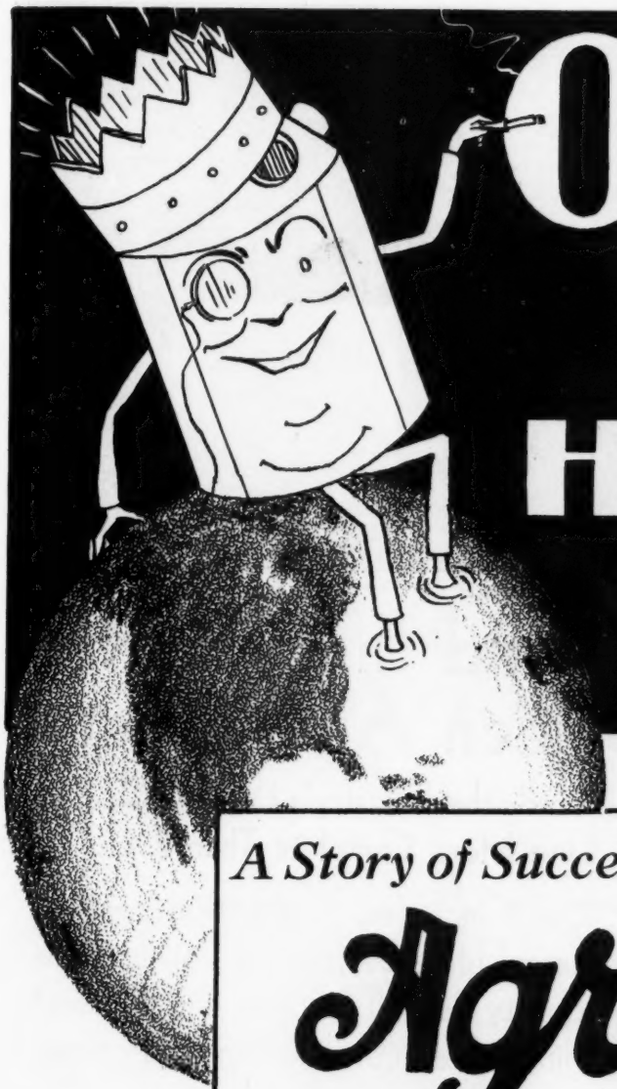
To buyers of any grade of flat rolled steel this new mill has advantages. For service and quality depend on equipment, as well as on raw materials and experienced men. And the New Inland Mill is *the highest development of continuous rolling equipment.* INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago, Illinois.

INLAND STEEL

ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Plates
Bands Structurals Piling

Rails Track Accessories
Bars Rivets Billets



On Top *of the* HEATING WORLD

A Story of Success as told by Himself...

Agricola "SUPREME"

"FURNACE WARMTH FROM THE SUNNY SOUTH"

"Only a few years ago my arrival was heralded. To say that I caused quite a stir in the furnace industry would be putting it mildly. Today, I enjoy an enviable position in the field.

"On top in so few years! An almost unbelievable record, you might say. However, this is not surprising when you know the facts:

"I was designed specifically for the present-day market—to meet the demand for Bigger Value. Prospective buyers are sold on my increased heating efficiency, massive castings, sturdy, smoke- and gas-tight construction. Dealers are quick to appreciate the advantages of the slipover front and other features that eliminate bolts and cement and reduce installing 25 to 35%.

"Without obligation to you, I would like to tell you about my proposition. I believe you will find it interesting. Write today."

AGRICOLA "Supreme," *Leader of Furnaces*

AGRICOLA FURNACE CO., Inc.
Gadsden, Alabama
Offices in Principal Cities

Steer Your Trucks to Greater Profits

INSTRUCT YOUR SALESMEN *always to mention the familiar Armco triangle and what it stands for: twenty-six years of rust-resisting, low-cost service.*

YOUR TRUCK GOES SCURRYING over the streets and roads, carrying tools and materials to the job; but did you ever consider it as an effective business-getter for your shop?

Paint doesn't cost much, and it does attract eyes. And when prospective customers glance at your truck, they ought to be greeted by a trim, freshly-painted body that bears a crisp, eye-stopping message about your service.

When you paint your truck, choose bright, harmonizing colors. Then standardize on these same colors for the exterior of your shop, and for any other equipment that is seen by the public. Use as little lettering as possible, and select words that sell your service rather than merely listing the kinds of work you are capable of doing.

This combination of fresh paint, earnest thought, and arresting words has brightened the outlook for many a struggling contractor. Use this idea to help increase profits and hold customers.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio

Distributors in the principal cities of the United States and Canada


INGOT IRON SHOP NEWS

Frameless Metal-House Now Being Constructed May Open New Field For All Sheet Metal Men

Metal Plays Major Part In Keeping Bakery Clean

BETTER SELLING

READ "INGOT IRON SHOP NEWS" every month for ideas and suggestions on how to stimulate sales, cut costs, and turn out better work. Published by the Armco Distributors Association, this valuable business-building paper is free to anyone concerned with sheet metal work. Write us if you want to get it regularly.

PROFITS COME WITH BETTER SELLING

ARMCO PRODUCTS

Help you sell

● Would you picture for yourself American advertising as it existed two decades ago? Follow business, then, as it seeks the markets of the world. Survey with men in American advertising agencies, the field of media in Britain, on the Continent, in South America, in the Far East.

There, in circulation claims, chaos still prevails. Expensive research and constant vigilance are needed in buying space. Advertising must surmount a needless hurdle—an obstacle which in this country has been removed forever.

Facing the same conditions under which advertising still struggles in other lands, American advertising sixteen years ago demanded a change. The regulatory force came from within. Advertisers, advertising agencies and publishers joined in founding the Audit Bureau of Circulations.

Everybody today knows the plainly printed reports of the A. B. C. They cover almost every important publication. They are packed with facts which the wise buyer of space takes pains to heed.

Men who seek the last dollar of value in their advertising budgets are not content with figures on paid circulation only. They search out the whole story, as told in the complete A. B. C. reports. And therein they find the gauge to true values in the selection of advertising media, the means to make an appropriation yield the results that modern business demands.

As a recognition of service, not only agencies and publishers, but a distinguished group of advertisers in the United States and Canada, hold membership today in the Audit Bureau of Circulations.

STANLEY RESOR

***President*, J. Walter Thompson Company**

"I thought that we had some appreciation of the value of the A. B. C. until we started work in countries where circulations are not audited. It is difficult for anyone in this country to realize what the absence of audited figures means in additional outlay of time, work, and money. In many offices in other countries it has taken our organization literally months of intensive advance work solely on the problems of circulation. Most of the information obtained under these difficulties, had there been an A. B. C., would have been instantly available.

"To these first costs must be added the continuing cost of keeping circulation data up to date.

"I think it can be safely said that the A. B. C. is one of the outstanding successful co-operative undertakings of the generation."

Stanley Resor

GEORGE PEARSON

Director of Media

Chicago Office, J. Walter Thompson Company

"Perhaps only those of us who have been buying advertising space for a time we have to measure in decades, can fully appreciate the great job the A. B. C. has done. And its work is just as necessary now as it ever was in the past.

"I think the current trend of business requires us all to give more detailed study than ever before to actual A. B. C. Audit Reports and Publisher's Statements. To appraise the circulation of a publication intelligently, we must know the distribution, circulation methods, subscription prices and other facts that are reliably shown only in the reports of the Bureau.

Geo Pearson

An advertisement by the
AUDIT BUREAU OF CIRCULATIONS
Executive Offices • • • Chicago

Yes! We still roll GOHI by hand

ROLLING GOHI Sheets is still done by hand in the Newport Plants, by choice and of necessity, too. The structure, the finish, the quality of the metal demands it.

For it takes hand rolling — and the finest kind of hand rolling — the continuous delicate adjustment of the mills, the hourly polishing of the rolls, the constant passing of the sheet back and forth to bring out all the qualities of the metal.

The result is GOHI. For almost a quarter of a century GOHI — an alloy of pure iron with copper added — has proved itself to be the one low cost ferrous sheet metal for building and fabricating purposes. It is low in first cost . . . in last cost.

This alloying of pure iron with copper also explains the easy working qualities of GOHI — the ease of stamping, bending, drawing, cutting and welding. Write for name and address of distributor near you.

GENUINE OPEN HEARTH IRON
TRADE GOHI MARK
PURE IRON - COPPER ALLOY
REG. U.S. PAT. OFF.

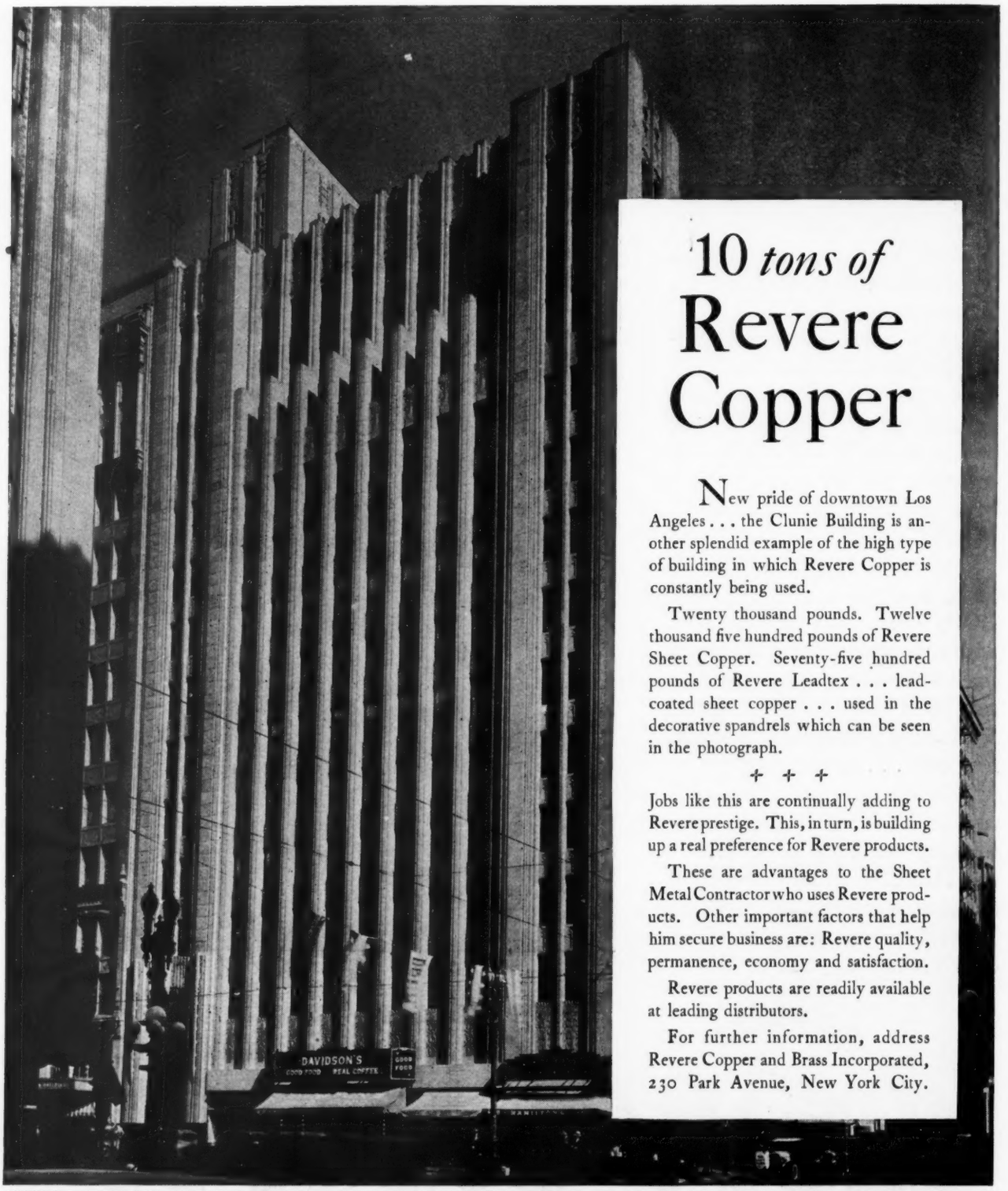
IT'S THE PURE IRON, ALLOYED WITH THE RIGHT AMOUNT OF COPPER, THAT GIVES GOHI ITS LASTING QUALITIES.

GOHI

PRONOUNCED "GO-HIGH"

SHEET METAL

THE NEWPORT ROLLING MILL COMPANY, Newport, Kentucky



10 *tons of* Revere Copper

New pride of downtown Los Angeles . . . the Clunie Building is another splendid example of the high type of building in which Revere Copper is constantly being used.

Twenty thousand pounds. Twelve thousand five hundred pounds of Revere Sheet Copper. Seventy-five hundred pounds of Revere Leadtex . . . lead-coated sheet copper . . . used in the decorative spandrels which can be seen in the photograph.

+ + +

Jobs like this are continually adding to Revere prestige. This, in turn, is building up a real preference for Revere products.

These are advantages to the Sheet Metal Contractor who uses Revere products. Other important factors that help him secure business are: Revere quality, permanence, economy and satisfaction.

Revere products are readily available at leading distributors.

For further information, address Revere Copper and Brass Incorporated, 230 Park Avenue, New York City.

Clunie Building, Ninth and Broadway, Los Angeles. Architect: Claud Beelman, Los Angeles . . . General Contractor: J. V. McNeil, Los Angeles . . . spandrels by Forderer Cornice Works, San Francisco.

Revere Copper *and* Brass

INCORPORATED

Revere COPPER BRASS Products

Baltimore *Division, Baltimore, Md.* Michigan *Division, Detroit, Mich.* Higgins *Division, Detroit, Mich.*
Dallas *Division, Chicago, Ill.* Taunton-New Bedford *Division, Taunton, Mass.* Rome *Division, Rome, N.Y.*

EXECUTIVE OFFICES: NEW YORK CITY
GENERAL OFFICES: ROME, N.Y.

VOLUME 101 AMERICAN ARTISAN NUMBER 14

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING

The "Ten Best Prospects" Sales Plan

—A plan that has been tried and proven in the field, and some of the products and sales arguments that will make profitable sales possible under today's conditions

WE have hit upon a sales plan so simple that we wonder why it was not thought of before. It meets every need of the day, because any sales plan to be used by the dealer today must be simple, workable and inexpensive. Those are the qualities of this plan.

First, it's simple — no elaborate preparations, no surveys, no lengthy mailing lists to be compiled. The dealer simply writes down on the form provided on this page the names of his ten best prospects—people who have money and can use his services. It's workable. All the dealer needs is a knowledge of the homes in his community. And he needn't spend a cent, if he doesn't want to.

Here's how it works. First list your ten best prospects. In the following pages are sixteen timely pieces of merchandise. On the line under each name is provided a place for what that prospect should buy. You know that from your familiarity with the conditions in and around those ten homes. Each of the products described is given a Figure number. On the "Should buy" line you jot down the Figure number of the products each of the ten prospects stands in need of. When you have done this you may have ten, twenty, thirty, forty, or more, possible sales. And remember that each one is based on your knowledge of just ten people, and their homes—which is certainly reducing the selling job to the absolute minimum.

MY BEST PROSPECTS ARE—

In the form below, write the names of just ten prospects you know have money they could spend for your service. This page tells you how to use the list:

Prospect No. 1 .....
Should buy .....
Prospect No. 2 .....
Should buy .....
Prospect No. 3 .....
Should buy .....
Prospect No. 4 .....
Should buy .....
Prospect No. 5 .....
Should buy .....
Prospect No. 6 .....
Should buy .....
Prospect No. 7 .....
Should buy .....
Prospect No. 8 .....
Should buy .....
Prospect No. 9 .....
Should buy .....
Prospect No. 10 .....
Should buy .....

Now as to the products. As we describe each one, we give you the high points of the sales arguments, both general and seasonal, for each product. This gives you the framework of your own selling talk or copy. And on the last page of the eight pages given over to this material we give you the name of the manufacturer or manufacturers of each of the items, using the same Figure number for the name as was used for the product.

The dealer who wants to "put his back" into a campaign can send out personally written letters to each of the prospects, follow that by a telephone call making an appointment, and close his sales with a personal call.

The plan has been tried and proven in the field. Start working on your first ten prospects today. You have a definite reason for approaching each one.

NOTE: Each product on the following pages has a Figure number. Under that number, on Page 20 will be found the manufacturer's name.

Here are some of the products furnace and sheet metal men have to offer to customers and prospects

HERE'S why people are more inclined to buy for their homes today than during the past few years: Several years ago most of us were doing a lot of running around. Today we aren't. Reduced incomes are keeping us home —and focusing attention on the home and its equipment.

We do more of our entertaining at home and for that reason we want our homes to offer a pleasing appearance and every possible comfort. When we know that the Jones family, or the Wilkins family, are to spend an afternoon or an evening in our homes, we want everything to be just right.

It is this state of mind that makes the home market a good one just now. The dealer who selects his prospects, matches their needs to the products he can offer, and goes about it systematically, can make sales while others are doing nothing.

Gutters and Downspouts

People are still willing to spend money to keep up appearances. Take downspouting (Fig. 1) and similar needed repairs. People will, of course, let them slide until some one is aggressive enough to point out how broken, sagging guttering or downspouting mars the outward appearance of a building. That's what some one was told before the job going on in the picture shown was sold.

Fig. 1—Action caught by the camera! There is work to be done, and this owner was convinced of the need for repairs to the downspouts which had lost some of their youth

Forced Air

August and September will be very good months to lay the groundwork for converting gravity warm air systems to forced air systems. The blower shown (Fig. 2) will provide positive circulation—which means greater comfort in the summer months and the winter months. Don't guarantee temperature decreases, but talk increased comfort through air circulation. Besides, the blower may be sold as the first step in a complete modernizing of the gravity heating system.

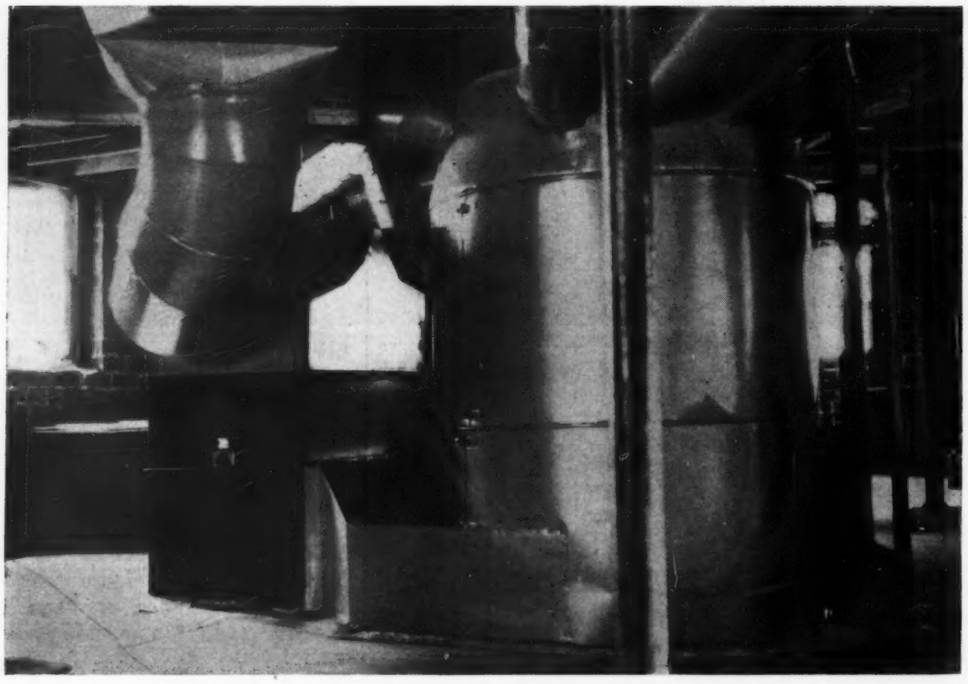


Fig. 2—The trend is steadily toward forced air systems. This unit will give the home owner the first step toward complete air conditioning

Oil Burners

The manufacturers of oil burners are coming to recognize the fact that the local retailer, well-established and with a good reputation, is the right man to market the oil burner. In the modernizing of a heating system, the addition of automatic heat should certainly follow, or perhaps precede, any other step in converting the system to forced air. The picture (Fig. 3) shows a conversion job with an oil burner delivering controlled heat. One, at least, of your ten best prospects is in the market for this comfort serving equipment.

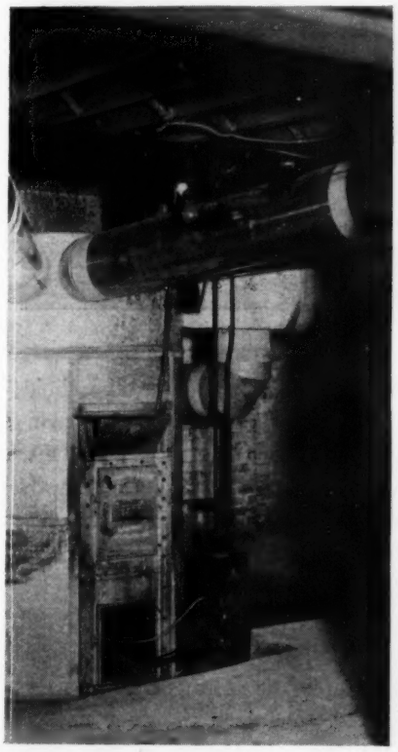


Fig. 3—Automatic heating has the call—and the oil burner industry is beginning to recognize the importance of the established local dealer

How to Use This Plan

1st—You have written on Page 13 the names of ten people you know have money.

2nd—Study the products in these seven pages.

3rd—When you come to an item which you know would appeal to one of your prospects, turn back to Page 13 and jot the Figure number on the line below the name.

For instance, if Mrs. Jones is Prospect No. 3, she may be interested in a downspout job (Fig. 1), or an oil burner (Fig. 3) and so on. Place these Figure numbers below Mrs. Jones' name. Do the same with the other nine best prospects.

4th—This gives you a workable list of ten live prospects and the products they should buy. You can then promptly start your sales efforts.

Fig. 4—Blower, washer and filter in one unit—another modern addition to the gravity job to increase home comfort

Basement Conditioners

Everybody is talking about the furnishing of conditioned air—an interest which the dealer will find in his favor when talking about such a unit as shown in Fig. 4. With its complete system of controls, it will turn the old gravity plant into a forced air system, with the attendant benefits of positive circulation, filtering of air and washing. These units are being sold with and without connections to the return air system, but most warm air contractors are agreed that we should not abandon the connected system in favor of a system, the results of which have not yet been established.

Residence Ventilation

Ever since spring we have been running articles on the subject of residential ventilation. The purpose of those articles was not only to give solutions to the problems encountered, but to point out the sales possibilities in this type of job. As air conditioning is more and more accepted, the dealer can sell roof ventilation, especially for second-floor spaces, as one means of relieving the load. (Fig. 5.)

Fig. 5—Roof ventilation can play an important part in air conditioning by eliminating part of the cooling load

Hair Dryer

The photograph (Fig. 6) showing the register installed in the bathroom is, of course, in the na-

Fig. 6—Something different to catch the attention of the home owner—a hair dryer for the bathroom

ture of what might be called an "outside ball." But with the number of house-to-house men going around with the conventional appeal for cleaning and repair jobs, the successful dealer wants to have something that has a novel appeal in order to arouse interest. That register works winter and summer (where there is a blower) as a hair dryer—a convenience any woman will welcome in her home. It can be installed inexpensively, some contractors using only conductor pipe to the register. Keep it in mind as an added sales point when you are talking about remodeling the old heating plant—it is the sort of thing that will attract attention and help put over the whole job.

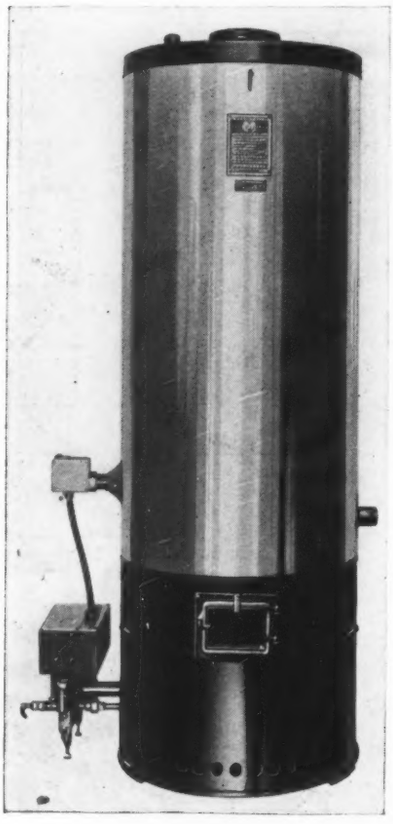


Fig. 7—An oil burning water heater; a good merchandising item to bring prospects to the store, and a good item to sell in competition with gas water heaters

Water Heaters

August and September bring their quota of warm weather and outdoor activities. It is an exceedingly uncomfortable thing to heat the water necessary for family use in the kitchen, as is still done in hundreds of thousands of homes. And this discomfort is increased during the summer when outdoor activities call for a greater use of the home's bathing facilities. The dealer in our field has, of course, the choice of handling a water heater using gas, or one which uses oil. For various reasons we feel that the oil burning water heater is his best bet. He avoids the competition of the utilities, has a unit that is less expensive to operate and which still offers all of the great advantages of the automatic storage type of water heater. Another thing—a unit of this kind, displayed in the store, gives an added reason for bringing people to the store where it becomes possible to talk and demonstrate other products. Fig. 7 shows one of these oil burning water heaters.

We know of no sales plan as simple in its operation as this "ten best prospects" plan. Easy to chart possible sales, as inexpensive to work as the dealer requires it to be, and effective because it gives accurate direction to his selling effort. Bringing the right products and the right prospects together is the very simple principle followed in this sales plan.

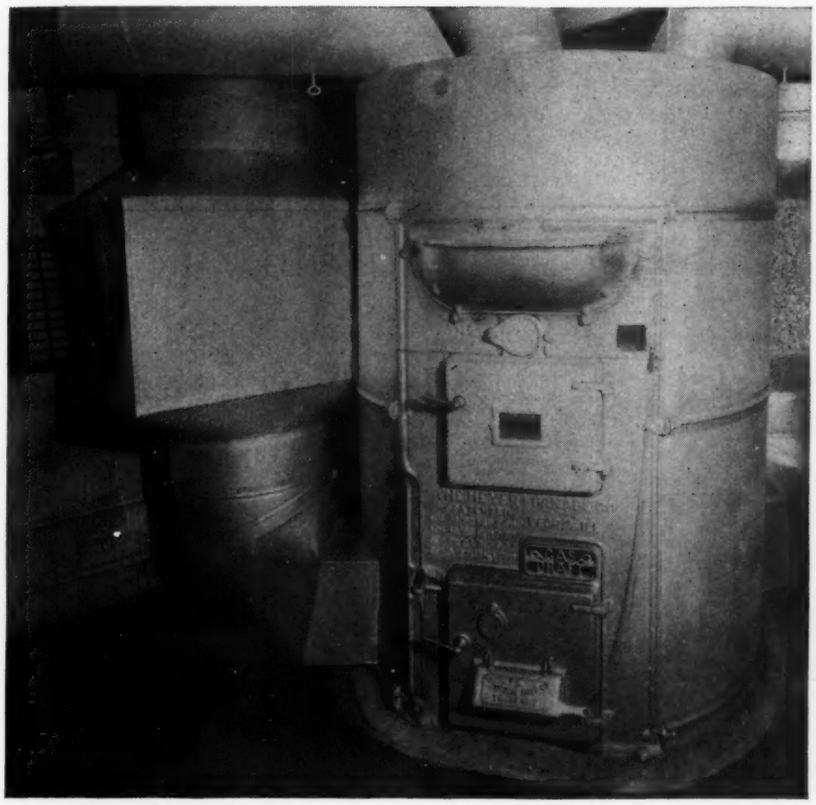


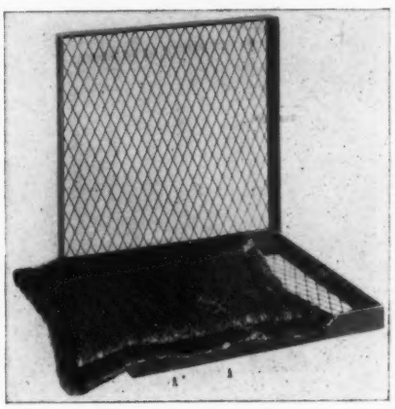
Fig. 8—Publicity is acquainting home owners with the possibilities of securing filtered air, and its advantages. Alert dealers can cash in on this publicity locally

Filters

A new world of sales arguments is opening for the use of the dealer in the various products that are being produced to make air conditioning a reality in the home. Take such an item as the filter shown in Fig. 8. On the necessity for clean air in relation to health almost any man can talk at some length—remembering that the U. S. Health Service has shown that respiratory diseases increase during the heating season. Then there is the added argument of economy. Dust in rugs, drapes, upholstery, carries on a silent campaign of destruction, grinding the fabric until it shows signs of wear. When the air furnished by the heating system is thoroughly filtered, the constant dusting, and the regular cleaning of rugs and drapes is largely eliminated, as is the wear and tear on the fabrics occasioned by the presence of dust. This filter can be used in gravity work when sufficient area to permit the air to travel through slowly is provided.

The filter shown in Fig 10 is of the "wafer" type, also suitable for gravity use. This type of filter can be cleaned by tapping, instead of the old "soap and water" method. Each of these filters represents the trend toward low cost and easy maintenance of filters.

Fig. 10—Another type of filter. Each of the filters shown on this page are inexpensive to buy and maintain



Auxiliary Furnace

In-between heating seasons offer a special problem, especially to the operator of a hand-fired heating system. The auxiliary furnace (Fig. 9) is designed to burn gas. It is possible to operate it during the few hours of the morning and the few hours in the evening during spring and fall, when a little heat is required for comfort. The rest of the time it is off. By varying the installation, with dampered pipes to such room leaders as the living and dining room, the cost of this in-between season comfort is made still lower.

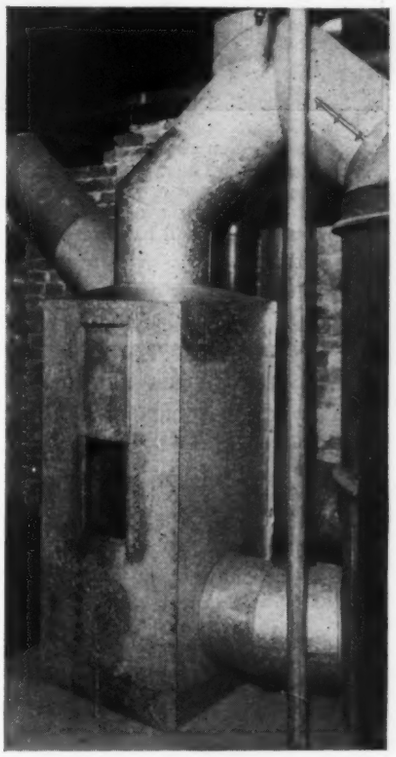


Fig. 9—An auxiliary furnace for spring and fall use; cabinet can be fabricated in the shop for use with small gas heating unit

Metal Roofs

Harmoniously-painted tin roofs are being accepted by some of the best architects in the country. Look at the photograph (Fig. 11). Note the difference introduced by the long lines running from ridge to eave. It is just such points of difference which catch the woman's eye. For length of life, resistance

Fig. 11—Something different in roofing. The tin roof here gives this house a distinction. And tin roofing can't be laid by carpenters and handy men.

to wind and weather, proof against leakage, it is difficult to name another type of roofing which will equal one of metal. You can point out, too, that the proper laying of a tin roof requires a high type of craftsmanship. For yourself, that means the elimination of the carpenter, or the handy man, who can lay a roll of composition roofing. Think, too, of the standing advertisement for future prospects of such a roof, differing from all others around it, and wearing year in and year out. Over a term of years you can assure your customer that the metal roof will represent a small investment, indeed.

Space Coolers

In your list of your ten best prospects you have the names of one or two of the better homes in your community. For such a home room cooling is a distinct possibility. The unit shown in Fig. 12 uses mechanical refrigeration, remotely located, of course. At the moment, no one can say through precisely what channels this type of equipment will move. But it is certain that the aggressive air conditioning merchandiser in any community will find himself offered the dealership for at least one of the many room coolers now available.

We show another type of room cooler in Fig. 13. In this unit, only the heat absorber, motor and fan are housed in the walnut wood cabinet, which is used with a remote ice chamber. The melting chamber is

Fig. 12—Room cooling is coming to the fore rapidly. Dealer outlets have not been settled. An opportunity for an established merchandising dealer. This is an electric unit

located in the basement, where a circulating pump forces low temperature water to the individual units. It is understood, of course, that by increasing the refrigerating capacity of either type of room cooler, the number of rooms to be cooled may be increased, each having its own cabinet.

Kitchen Ventilator

If a dealer, in making out his list of ten best prospects, were to try to think of something that absolutely every woman in his community wanted, he would certainly think of a kitchen ventilator of the type shown in Fig. 14. Here is a merchandising item, low in cost, easily installed, and giving a positive comfort to the woman in the kitchen. The use of this ventilator is unlimited by season or location. The woman in the bungalow, or in the apartment house, will appreciate the comfort of having heat and odors removed during both summer and winter from the room which is her work shop. For good operation, such units should be installed as close to the ceiling as possible. If you are to sell a kitchen ventilator, pick one that has capacity. It will not be difficult to recall to any family where the dining room is adjacent to the kitchen, that it is decidedly uncomfortable to settle down to a fine meal when the heat from the cooking range has rendered not only the kitchen but the dining room uncomfortably warm.

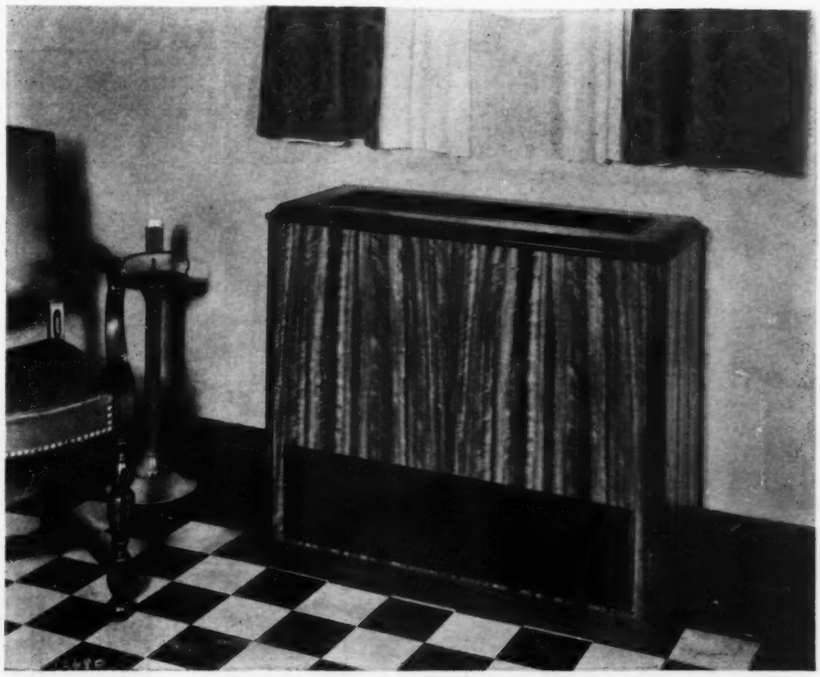


Fig. 13—Room cooling with ice holds wide possibilities. The cabinet shown here has chilled water furnished from ice melting chamber in the basement

Metal Sinks

Modern kitchens are small. That means that, in many homes, there is no space for a pantry. The re-

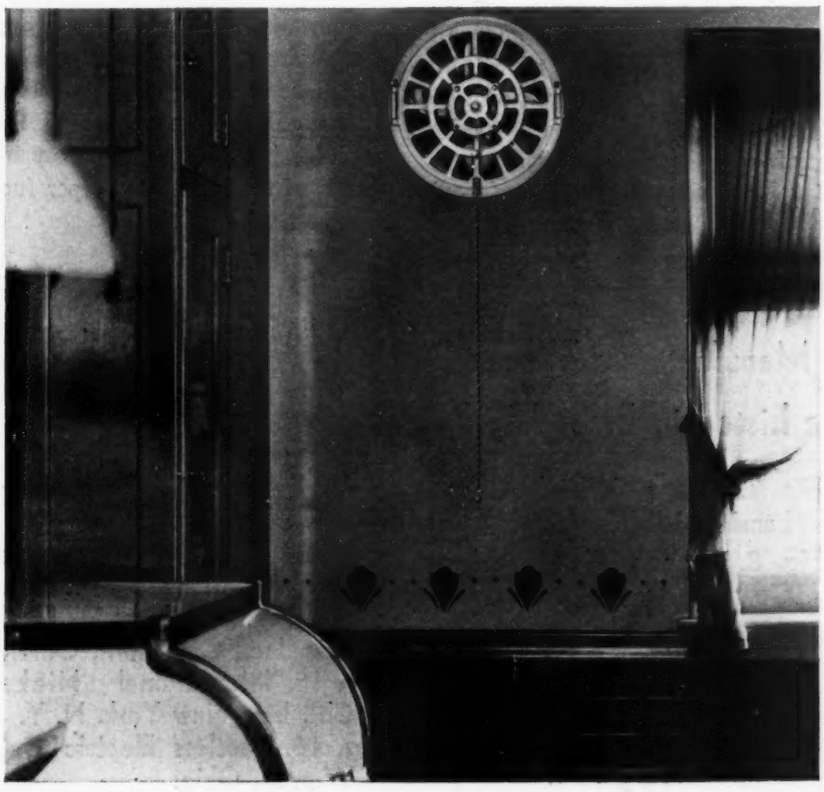


Fig. 14—An item that is universally wanted. Every housewife would like to have her kitchen equipped with a ventilator like this to make it more comfortable

This "ten best" prospect plan is simple and inexpensive. Just write down the names of ten good prospects in the form on page one and jot down the products each one should buy.

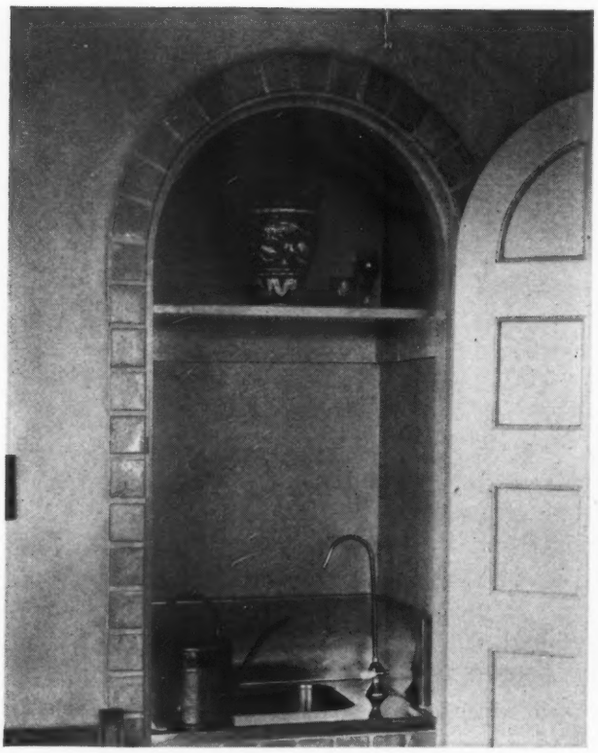


Fig. 15—A sink of monel metal—a special size. Such equipment can be fabricated in the shop

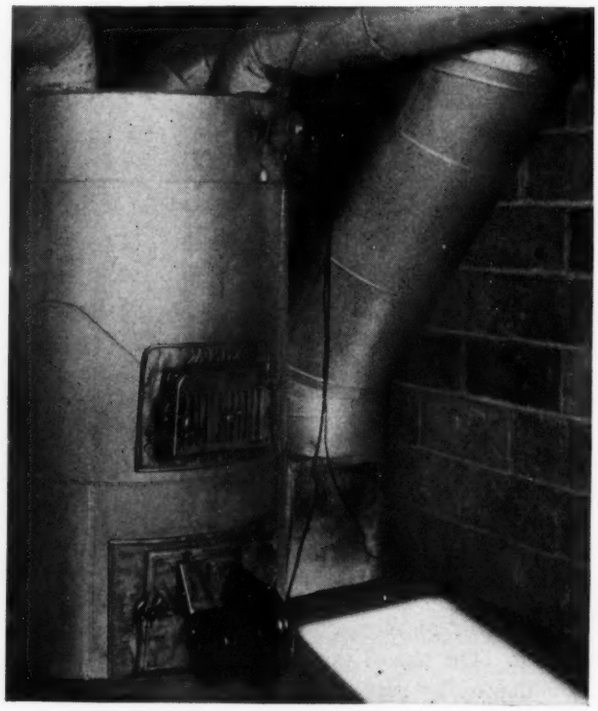


Fig. 16—A blower to make possible the use of the cheaper kinds of coal with quicker pick-up when heat is needed

sult has been the introduction of cabinets which will often cover almost the entire wall area of the kitchen. The Monel metal sink shown in Fig. 15 comes, of course, in standard sizes. But where cabinets have been installed, or where there is a special need for sinks, the area is often unusual. Here the sheet metal man may fabricate a sink, and perhaps some working areas, of metal. Some one of the ten best prospects—perhaps all of them—do not know that metal can be had from you in special fabrications.

Forced Draft

Coal economy is a thing of importance, and probably never more so than just at present and during the winter ahead. Home owners will study their fuel bills and will be trying to find ways of cutting them. With the blower shown in Fig. 16 inexpensive coal may be used. It offers the further advantage that where there is a forced air system, and the room thermostat calls for heat, opening the draft door, the resultant pick-up may be slow and uncertain. A blower of this type may be connected in with thermostat and fan, and will give immediate and positive draft to the coal fire when there is need for more heat. Whether in a gravity or forced air system, therefore, the installation of a blower of this type means a quicker response to the need for heat, and an economy by reason of the fact that cheaper fuel may be used.

Key to Manufacturers Whose Products Are Listed in Preceding Pages

Fig. 2. A. Gehri & Co., Tacoma, Wash.
Fig. 3. Timken Silent Automatic, Detroit, Mich.
Fig. 4. The Meyer Furnace Co., Peoria, Ill.
Fig. 5. The Paul R. Jordan Co., Indianapolis, Ind.
Fig. 6. (Any valved register).
Fig. 7. Motor Wheel Corp., Lansing, Mich.
Fig. 8. Owens-Illinois Glass Co., Toledo, Ohio.
Fig. 9. (Shop fabricated).
Fig. 10. American Air Filter Co., Louisville, Ky.
Fig. 11. Follansbee Brothers Co., Pittsburgh, Pa.
Fig. 12. Frigidaire Corp., Dayton, Ohio.
Fig. 13. Lewis Air Conditioners, Inc., Minneapolis, Minn.
Fig. 14. Victor Electric Products, Inc., Cincinnati, Ohio.
Fig. 15. International Nickel Co., Inc., New York. N. Y.
Fig. 16. Peerless Electric Co., Warren, Ohio.

Tentative Program of 1932 Summer Cooling Project Now Under Way in Our Research Residence

Readers who have been following the development of the residential cooling market will be interested in the program under way at the Research Residence in Urbana. Here is the program on which test data are being taken. Reports will not be available for several months yet. Notice is called to the allied lines of test covering use of insulation, awnings, window shades, etc. The Research Committee feels that interesting facts will be developed from these allied activities.

A COOPERATIVE Investigation of the American Society of Heating and Ventilating Engineers, the National Warm Air Heating Association, and the University of Illinois Engineering Experiment Station.

I. *Object*—The principal objects of this investigation are:
   1. The determination of the cooling load and its hourly variation when cooling the Residence as a whole, under both night and day conditions.
   2. The allocation to the various rooms of the heat entering the Residence, and the determination of the hourly variation in the cooling load of the individual rooms, under the same conditions as in (1).

Note—Either ice or mechanical refrigeration may be used, although the first studies will probably be made with ice.

II. In general, the test program will cover the following items:
   A. *Residence studies*
   1. The entire Residence will be cooled by the main cooling plant which will be located in the basement with—
      (a) The window shades pulled half way down (normal position).
      (b) Window shades pulled all the way down.
      (c) Shades normal, but awnings at all East, South and West windows.
      (d) Shades normal, but with blinds closed.

Notes—In all of these Residence tests the windows will remain closed at all times. No outside air will be used in any of the tests under Part A-1.

The entire Residence will be cooled with the exception of the third floor and the Sun Room, which will be closed off from the rest of the house. The third floor will be regarded as an attic space.

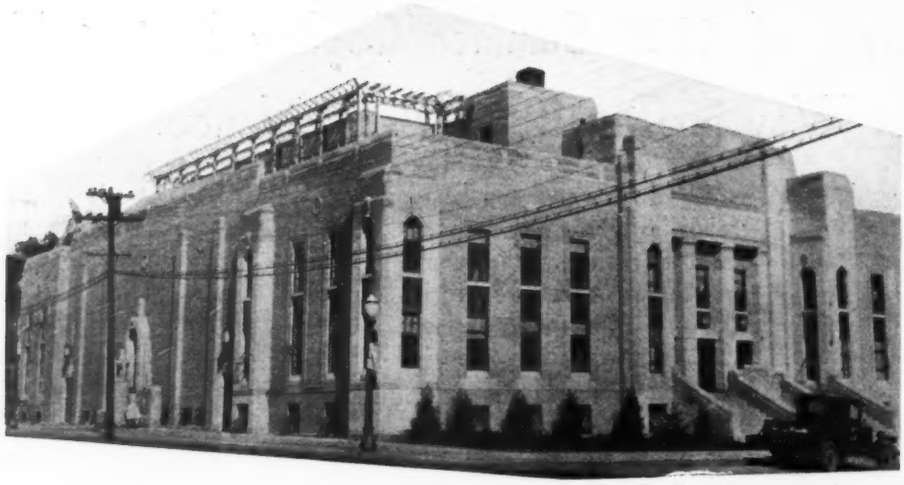
The house temperature will be so controlled as to maintain a constant difference between the outdoor and indoor temperatures at all times (probably 10 degrees F. lower).

   2. With the windows protected from solar radiation by awnings, night air circulated through the house by means of the present warm-air, forced-air system having an intake duct taken directly from outdoors. Windows and doors will be kept closed during the day. No additional cooling will be done in this case during the day by either ice or mechanical refrigeration.
   3. If the house temperature cannot be kept 10 degrees below the outdoor temperature through the day by (2), this method may be repeated, but additional cooling will be supplied when and as needed by means of the cooling plant in the basement.

   B. *Individual Room Studies*—(To be made in Living Room, Dining Room and Kitchen on first story, and East, South, West, and Northwest Bed Rooms on second story.)
   1. During these studies, the individual room in which the study is being made will be cooled by a small unit cooler, using ice, located in the room itself. The rest of the Residence will be kept at the same temperature as the room in which the study is being made by means of the main cooling plant in the basement. Readings will be taken which will show the hourly variation in cooling load for each room studied as well as the rate of dehumidification. It is intended to make these studies both with and without awnings at the windows.
   2. The above test will be repeated, using one room at a time (Living Room or East Bedroom), but only the room in which the test is being made will be cooled. The main cooling plant in the basement will not be used during this test.

   C. *Attic Tests*—The attic, or third story, will not be cooled, however, the attic temperatures will be taken at regular intervals when:
   1. The attic is closed and not ventilated.
   2. The attic is ventilated by means of a small exhaust fan.

   D. *Air Washer Tests*—A limited number of tests to determine the possibility and effectiveness of cooling the Residence by using an air washer supplied with city water.



Two faces of the Sterling, Illinois, auditorium are ornamented with copper spandrels of two styles. The general appearance of the spandrels is shown in the close - up photograph below. These spandrels are all hand made

Shop Fabricated Spandrels

THE photographs and drawings accompanying this article illustrate how the skillful metal worker meets architectural specifications for ornamentation and protection with only the tools found in the ordinary shop and the skill which comes with long apprenticeship in fabrication.

The building is the municipal coliseum finished last winter in Sterling, Illinois. The contractor who fabricated and placed the metal work is Percy Clutterham whose shop is also in Sterling.

For the ornamental spandrels and the gutters and downspouts almost one ton of 16-ounce copper was used. In addition, a sizable amount of galvanized iron was used for a ventilating system for the motion picture projection room, the kitchen and stage ventilator pent house on the roof.

All the work on this job excepting the downspouts which are standard sections was designed, patterned and fabricated in the Clutterham shop. Hand tools and the cornice brake were the only pieces of equipment used.

The Spandrels

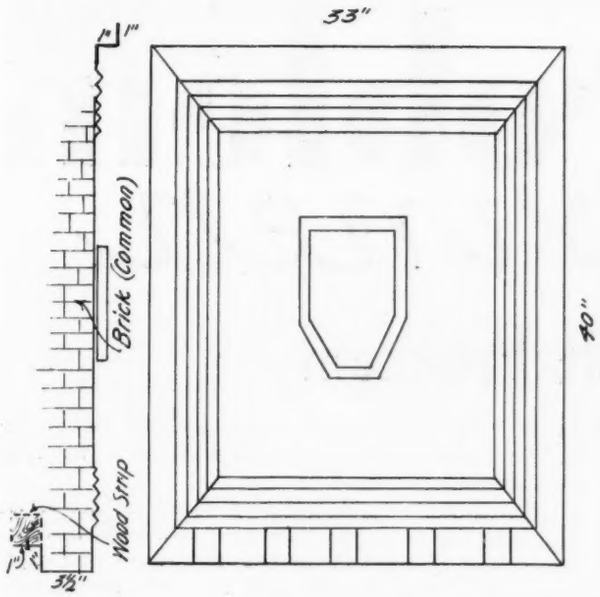
Between the first and second floor windows copper spandrels are used for ornamentation. Twenty-three units were required for the building. Two styles of spandrels were used, one having flutes on four sides and the other having only vertical flutes.

The spandrels having flutes on four sides were formed from one sheet of copper excepting for the emblem at the center and the dentil blocks along the top and bottom. The corners were cut in to the inside of mitered corrugations—cutting out enough metal to allow for perfect miters. After the metal was cut, the flutes were formed on the brake and the edges of the miter turned into the back side and soldered.

The spandrels having only vertical flutes were fabricated in a similar manner.

The emblems used were formed of six sections, all 1-inch high and square in cross section, and were soldered on the inside to the copper face sheet. Dentil blocks were formed on the brake and soldered to the face sheet on the back side. Details and sizes of the spandrels are shown on the two sketches.

The spandrels are held into the wall in two ways. On one type of spandrel a separate hook strip was soldered along the bottom under the dentil belt. This strip fits over the iron window frame. On the other



The buttress faces use spandrels of this type with four fluted edges. The faces, including the flutes, were formed from one piece of copper with the mitres cut to give a smooth fit and seamed behind the face. The shield in the center was fabricated from six sections and is soldered to the face

spandrels the stone work was slotted on all four sides adjoining the spandrel and the spandrel was slipped into the slots and caulked. All spandrels were caulked with Oakum and gray caulking cement of the knife grade.

Gutters and Downspouts

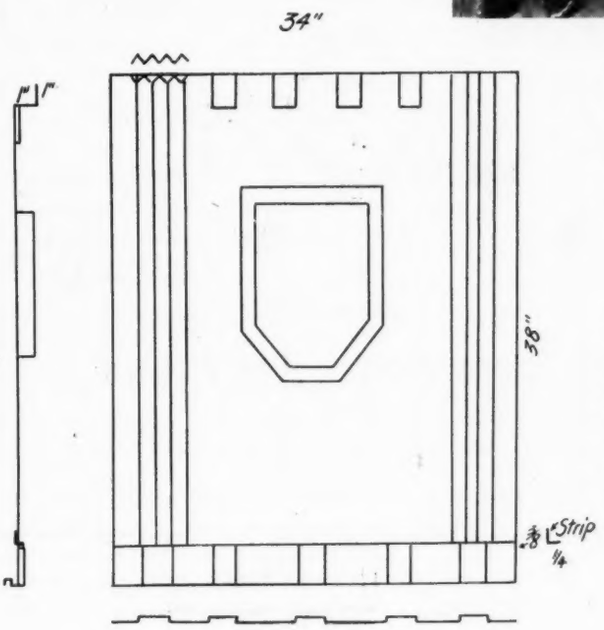
More than 500 feet of copper box gutter was required for roof drainage. The gutter is the high back style as shown in one of the photographs taken along side the roof pent house. The downspout is corrugated round fitted into sleeves which are also corrugated. The gutter is supported by top straps.

Drainage for the main roof is through inside pipes, collecting from sumps scattered around the edges of the roof.

The box gutter was formed in the Clutterham shop and delivered to the coliseum in lengths convenient for hanging. Joints were soldered after erection. In most instances these sections were ten feet long.

Ventilation

A fire door ventilator is located on the roof above the stage. This



Drainage is by copper hanging gutters and downspouts. Below the roof downspouts are inside wall pipe

Most of the spandrels are of the type to the left with two vertical flutes. The fabrication was made on a hand brake and with hand tools. Dentil strips were separately formed

pent house is about 6 feet high and 7 feet by 9 feet in area. The sides and roof are all galvanized iron, painted. There are three fire doors, all hung horizontally, and held shut by a fusible link. The fusible link is a part of the regulating chain since the doors are also to be used for stage ventilation. Chains operating through pulleys control the doors from the stage.

The doors are so fabricated on their wood frames that when closed lips keep all water out of the ventilator house. Standing seams are used for the walls and roof.

. . . the problem corner

A Floor Draft Problem

WE asked our readers to give us a lift on a floor draft problem presented in the June issue on page 27. The installation is a remodeling job in which several changes have been made over a period of time. The drawing shows the present arrangement of the system and the trouble is explained in the reading matter alongside the plan.

Several replies have been received—all indicating that there are fundamental faults with the present arrangement and explaining, also, that some further alterations will have to be made before the system can work satisfactorily.

Anonymous Reader

The first answer was received from a reader who wishes his identity withheld. This reader says:

"We are always interested in offering helpful suggestions to heating men or owners of warm air heating plants that may be in trouble and we have taken the time to make a sketch of the floor plan on this page 27 and our answer is very obvious on the floor plan we are enclosing.

"The floor draft in the living room should be obvious to anyone who knows anything about heating. There is a large northwest and northern exposure in this living room and bedroom. A cold air face located at the outside wall will gather the cold air from the bedroom and air which seeps in from the porch and the front windows. It will return this to the furnace through the cold air duct instead of using the floor of the living room as a cold air conveyor.

"We have also suggested a change eliminating the double header feature between the dining and living rooms for warm air and substituted a 10-inch pipe for heating the kitchen. We then place a double header between the living and dining rooms and double header between the living and bed rooms. This gives you a simplified control and distribution of the warmed air coming from the heater and will positively reduce fuel consumption and eliminate practically all of the floor drafts in this living room.

"We might add if the same careful attention had been given in years past to gravity installations as is now being given to forced air work, the warm air furnace industry would be on a higher plane of efficiency and satisfaction to the American public than it is at the present time.

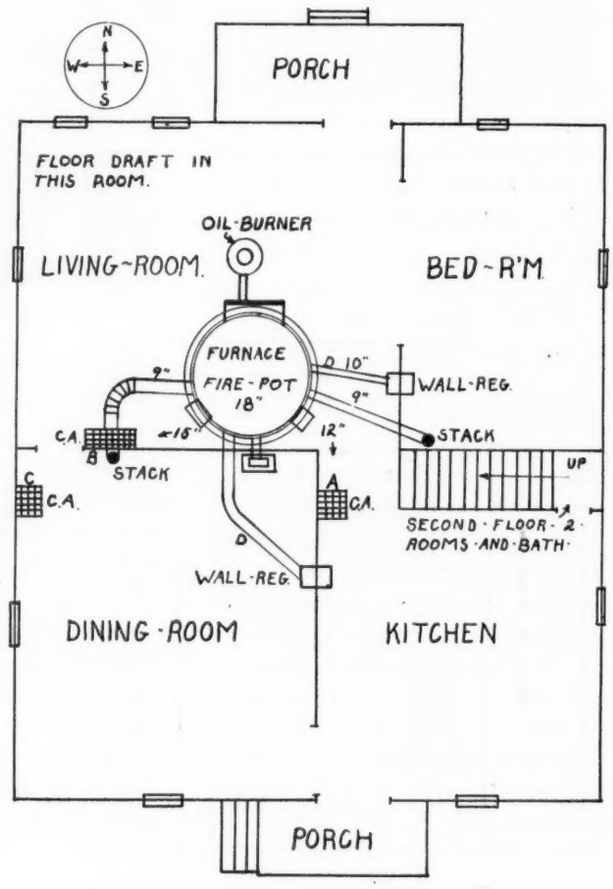
"We might add that we show two faces to be hooked up together to a 14-inch pipe, one in the living room and one in the dining room, but the two faces are not necessary as one face on the dining room side would answer this purpose, but probably not quite as well as two faces would.

"We have not shown the size of the faces on the plans as this can be determined because they may want them square or they may want them narrow and long to fit the rug border requirement."

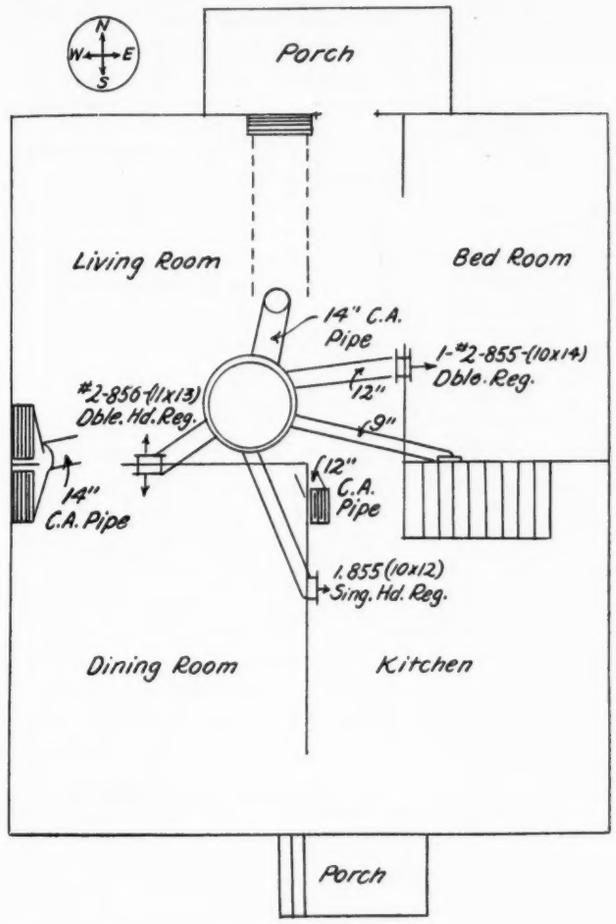
B. F. John, Philadelphia

Another interesting solution and also a thorough analysis is submitted by B. F. John, well known heating contractor of Philadelphia and contributor to AMERICAN ARTISAN. Mr. John says:

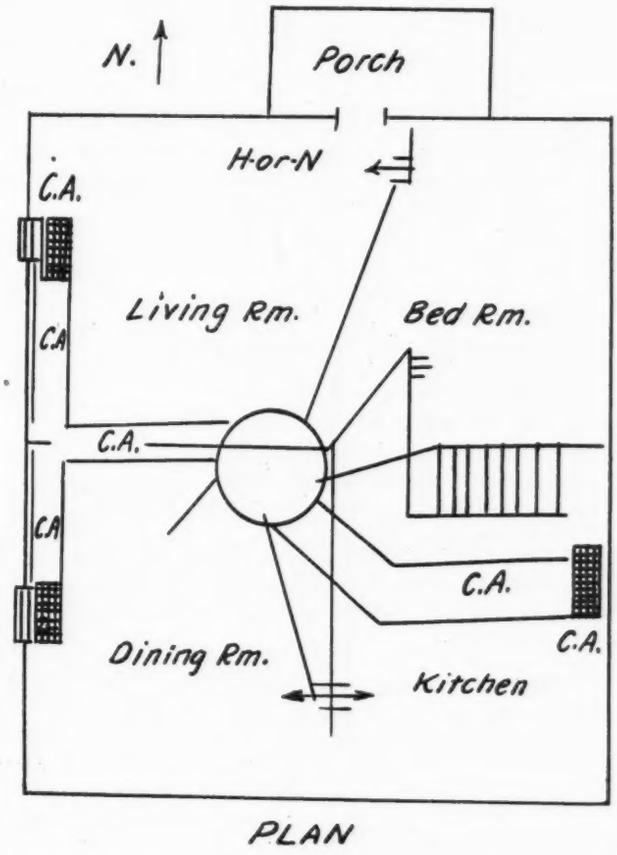
"Some practical heating men, who had changed heat and return air and success-



This plan shows the arrangement of rooms on the first floor. There are two rooms above. The whole house heats satisfactorily, excepting that there is a disagreeable floor draft in the living room. A cold condition was overcome by installing return air face A but this did not eliminate the draft. An interesting feature is that the draft is most noticeable in mild weather



Left is shown the revised layout suggested by the anonymous reader. Note the changes in the warm side and the increased cold air placed to relieve drafts and cold areas.



Right are shown the suggestion of B. F. John. Increased inlets and outlets to provide better distribution and collection of air are the reasons for these alterations

fully cured floor drafts in gravity recirculating warm air heating systems, were discussing the subject and agreed finally that to avoid these drafts it was necessary to consider each house separately and note several things that were found to be the cause generally.

"After the correct size heat leader for each room and return air grille was found, whether checking up on an old job or installing a new one, the correct position of heat register and return grille should be marked, bearing in mind the following points that cause drafts naturally in winter.

"1. Note the prevailing wind sides of the house, as pressure is exerted through a house from these sides and moves interior air in its direction from the coldest walls, and retards the heating of these walls when the heat register is at a distance from them.

"2. Note the side and use of the rooms at the prevailing wind sides, especially the distance of the inside partition, where the heat register may be placed, from them. A living room where the family congregate in the evening should receive special attention, in order to clean out cold corners.

"3. Heat registers should be placed on inside partitions as near as possible to the prevailing wind side walls, but not in them, and as near as possible to the outside walls in the other rooms and halls. The exception being in small rooms or inside rooms well protected, where registers will heat equally as well in any position, such as baths, second floor halls, etc.

"4. The return air grilles should be placed:

a. One at the base of the stairs when in a hallway, when no returns are taken from the second floor.

b. Under or near outside windows or door in large or wide rooms next to the prevailing wind sides of the house, in order to draw the heat to the coldest point, by catching the colder air falling to the floor from outside windows and doors and cracks in walls, and to prevent it from crossing the floor.

c. In other rooms it was found that the return air grilles gave better service when their position was at a distance from the heat register, placed so that the heat would travel or spread through the largest amount of air in the room before being drawn into the return, whether on inside or outside wall.

In the coldest weather the speed of the air in the returns increases and the suction is more powerful with the higher fire.

"Experience has proven that the wind pressure, which exists in every house, may be made to assist a heating system, if the location of the heat registers and grilles are studied, and that it is much easier to carry warm air through a round heat pipe in a warm basement, to the coldest part of the room, than it is to deliver it through a short pipe to the warmest part of the room, and make it fight its way through the entire cubical feet of colder air in the room to the coldest walls, which in proper heating should be heated first. After these are heated, the pressure will carry the heat with it through the balance of the room.

"All heating engineers recommend that after the heat loss is figured that an additional percentage of that amount be added to North, Northwest, West, and Northeast rooms, mainly because of wind pressure or the speed of the wind, as a high wind striking walls at right angle adds further infiltration through certain types of walls, and when traveling

parallel to the walls adds heat loss by its increased speed over the surface or increased loss by further convection.

"If the heat pipe sizes shown equal the heat loss from the rooms and the kitchen and dining room is the same size as the living room and bedroom, as these appear to be one-half of the first floor, the heat pipe area total is 284 sq. in. and the returns 290 sq. in., which leaves only 6 sq. in. for expansion of air and easy flow, which with an oil burner means greater speed of air, higher temperatures and overheating, partially dependent on the position of the thermostat, which is not shown.

"The draft in the living room will cease when the Northwest corner of the room is well heated, or North and West walls, and a change to a single register for this room placed in the North inside partition between living room and bed room, or a floor register placed out of line with the front door, if the porch is not enclosed. The return placed under the West window will materially help to do this and less fuel will be burned.

"The kitchen draft may have two sources; down the stairs and around it to the grille during a cold day until the room is thoroughly heated, or the lack of heat being drawn to the largest part of the room adjacent to the outside walls. A change of register and grille as shown on the accompanying sketch has prevented drafts.

"If the grilles in the dining room and living room were enlarged and a total of 355 sq. in. of air returned that would help considerably.

"Return air in the kitchen is wrong and if insisted upon the owner should be told that he may expect certain odors from cooking to permeate the other rooms. The kitchen should be vented to the loft, and additional heat provided.

"Drafts of this nature always increase in milder cold weather, especially with an oil burner which is on and off, when no attempt is made to catch or direct the cold air entering by infiltration around windows and doors, and the heat register is not in the proper place to heat the point of entrance of cold air. The fire checks in milder weather, yet the entrance of colder air does not stop and cools first, and dropping to the floor causes a draft to the point of outlet."

W. H. Kuehn, Minneapolis

A third solution is sent by W. H. Kuehn of the Kuehn Heating Company, Minneapolis. The additional notations sent by Mr. Kuehn are equally as interesting as the solution proper. Mr. Kuehn says:

"I agree that there would be a very bad draft. It is stated that the house heats with an 18-inch—it may, but how?

"A rough calculation of heat requirements according to Standard Code (no room sizes or window measurements being shown) would show as follows:

Living Room	90
Bed Room	60
Dining Room	68
Kitchen	68
Total	286
2—2nd Fl. Rms., 35-inch each	70

"For furnace size adding 50% excess to second floor, add to first floor and 10% of whole for first floor would show 441 sq. in. necessary. For piping I would use a 14-inch double-head for living room and bed room, a 14-inch for dining room and kitchen and two 8-inch for second floor rooms. This makes 408 inches.

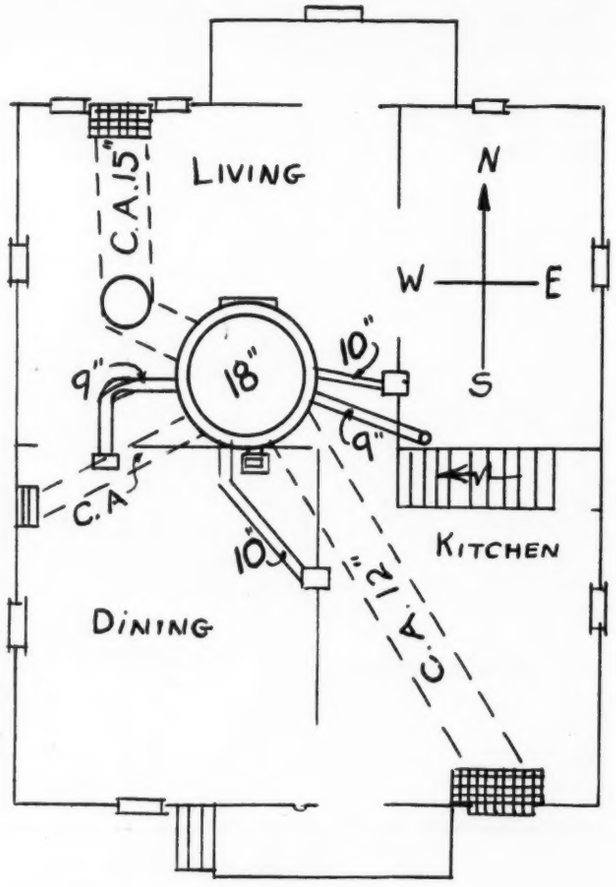
"As near as I can judge, two 10-inch and two 9-inch hot air pipes are used, or 280 sq. in. This furnace is choked in capacity and in pipe sizes.

"Return air in living room is wrong—it should be located near front wall near door to porch. Similarly for return air grilles in dining room and kitchen—they should be near rear wall and kitchen grille on outside wall. By bringing return air to amount of hot air or more (in excess of 408 inches) and using a 22-inch firepot at least, and preferably a 24-inch, I will absolutely guarantee to heat this house without drafts. The 9-inch to second floor are not necessary as 8-inch is ample to heat a good sized room.

"There now exists a small volume of 'hot' air—this change will show a large volume of 'warm' air. The difference in this change will be so great that words cannot adequately describe it. Using the B. t. u. method would show a heat loss of about 40,000—and no 18-inch firepot can do this. I would like to see this tried and get report.

"It is stated that 'close-in' return air ducts circulate better. They do—but distant or outside cold air ducts make for comfort—they draw warm air to outside walls and make more even the temperature.

"Drafts are caused by faulty installation and undersized furnace. Drafts are temperature difference between warm air and return air—even it up and trouble is cured."



Mrs. W. H. Parker submits this sketch to show how she would alter the system if the job was put up to her. Outside cold airs and double registers for some of the rooms are used for economy. Mrs. Parker would catch the infiltration and drafts before they cross the floor

Mrs. W. H. Parker

From Abingdon, Illinois, Mrs. W. H. Parker, who with her husband operates a heating and sheet metal shop, sends an interesting so-

lution and a sketch showing altered cold air returns in accordance with their experience. Mrs. Parker says:

"Your floor draft problem is interesting. It seems to me, however, that the problem can be very easily solved by changing the return air. If the contractor will take his cold air from the north side of the room, either from a grille between the two front windows in the living room or from a grille beside the front door, instead of making the air sweep from the bedroom and north part of the living room around to the cold air grille in the center of the house, he will not have a floor draft.

"By placing the grille at the north wall, the warm air is drawn to the far corners of the room by natural circulation and the return air is under the floor instead of on top of the floor.

"When heat comes into a room from one corner, my husband and I have found it best to take the return air from as nearly opposite as possible. This eliminates floor draft."

B. L. Schwartz, Pittsburgh

B. L. Schwartz, in Pittsburgh, suggests locating a return between the front windows to stop the draft before it starts across the floor. He says:

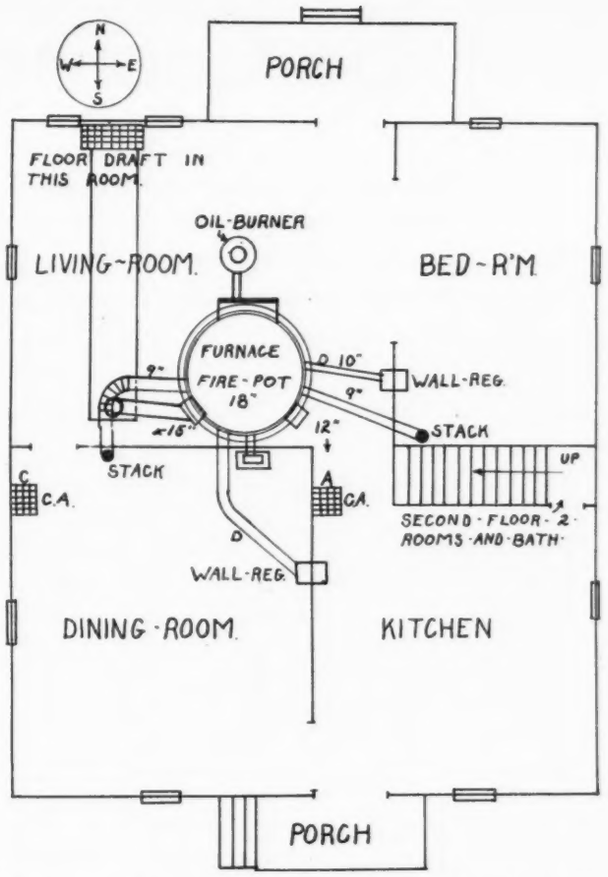
The floor draft problem submitted on page 27 of your June 20th issue can easily be overcome by relocating the intake at the north end of the living room, instead of as at present.

The fact that the draft is worse in mild weather might be caused by the following:

The furnace is small and undoubtedly must be forced in cold weather. This results in high bonnet temperature, with resultant high stack or riser temperatures. When this occurs, air circulation is increased and results in better uniformity of temperature all over the house. In mild weather, circulation is slowed up; and stratification becomes more noticeable.

The fact that the furnace is directly under the living room, will cause an appreciable amount of radiant heat to be directed against the living room floor. This will help to offset the cold air draft coming from the north exposure. In mild weather, this condition is reduced.

Relocation of the living room return air intake as indicated, should correct the draft difficulty."



This sketch shows the suggested changes made by Mr. Schwartz and Mr. Hunt. They differ only in the location of the drop into the casing, but the location of the return is the same. The purpose of placing the grille between the windows is to catch the cold, infiltering air before it starts across the living room floor

A. W. Hunt, Kansas City

Arthur Hunt of Hunt Brothers, Kansas City, makes practically the same suggestion as Mr. Schwartz. His only change is to move the cold air boot farther toward the front of the furnace to shorten the joist run. His reason for this suggestion is the same as the one advanced by Mr. Schwartz.

Floor drafts are one of the most pernicious problems the warm air heating contractor encounters. Oftentimes they occur in unsuspected places and put on their acts when least expected. Just such a problem has been presented here. If you have suggestions which will aid this contractor, send them in—that is what this department is for—full discussion of everyday problems.

Ice Cooling For Homes

So many questions were received asking about costs and results in Mr. Kitchen's cooling plant that we arranged with him to keep a record during a typical operating period. These data constitute, we believe, the first authentic report on ice cooling in a residence. You can answer every sales question from this chart.

By John H. Kitchen
Kitchen Engineering Co.

THE AMERICAN ARTISAN described, in the May 9 issue, the cooling equipment used in our residence. Some minor changes have been made in this installation since previous tests were made.

The present test started Saturday noon, July 16th, and extended to eight-thirty P. M. July 20th. Considerable variance was found in the water temperature. The conclusion reached was that the suction line of pump was pulling out the warmer water. Baffles were installed to make the water circulate in the tank. The result reflected in the test July 20th shows favorably; i. e., more steady water temperature.

Cost

The first question invariably asked is *"How much does it cost to cool a residence?"* This is but natural, as the majority of people have to consider the home budget. Our experience indicates that it is seldom necessary to cool *all* the rooms at one time. Rooms should be cooled *as the rooms are used and occupied.* This naturally reduces the cost of operation.

During the test week outside temperatures averaged from ninety-four to one hundred degrees F. in Kansas City, and over one hundred, as reported by twenty-two Government stations in Kansas and Oklahoma. At noon, July 16th, Kansas City, Missouri, weather bureau reported 94.2 D.B., 75.8 W.B., 43 relative humidity; and at seven P. M. same date 95 D.B., 72 W.B., 32% relative humidity. Average wind velocity seven to eleven miles. During prolonged period of hot weather it is not unusual to see higher temperatures at seven P. M. than at noon. Hence the greatest need for home cooling appears to be in the afternoon and early evening.

Location and Sun Effect

Our residence faces west. It is protected by an adjoining residence from the early morning east sun. The need for cooling in this case is less in the A. M. For economy of operation we find that the starting of cooling plant at one to two P. M. is most advisable, and continue to seven P. M. On Sunday, July 17th, however, we started cooling at eleven A. M., had lunch in a cooled breakfast room, prepared in a cooled kitchen, then adjourned to a cooled living room, and later for a snooze in a cooled bedroom. We had intended to go for a drive or to the movies, but remained comfortably "at home." Several of the neighbors dropped in to "cool off." Our dog gravitates toward the inlet register and seems to like the incoming cool breeze.

No set rule can be given on the most appropriate time for starting, as the location of the building and sun effect are the governing features. Operating expense *can be controlled by rooms cooled and number of hours the plant is operated.* All that is necessary is to regulate fan speed and cut on or off the damper to individual rooms. During week days the program would be changed.

It is fine to be able to control the temperature during the summer period, particularly during ninety degrees, to or above one hundred degree temperature. Apparently the need for cooling does not start much before ninety degree outside temperature. Reference to the chart shows temperature readily maintained at or around eighty-two degrees, *regardless of outside temperature,* but affecting only number of pounds of ice used.

Cost of ice twenty-five cents per hundred pounds delivered, as against normal rate of thirty-five cents per hundred.

Effect of Wind

No figures are obtainable. The wind velocities have been low during period of test. The highest wind velocity eleven miles per hour, and down to seven miles or less according to weather reports.

At the Kansas City Airport, Friday, July 15th, the temperature dropped from one hundred and one degrees at five P. M. to seventy-five degrees early Saturday A. M., July 16th. A somewhat remarkable range of temperature. But without noticeable wind movement (almost a complete calm during the night) the twenty-six degree temperature drop was virtually wasted in so far as human comfort was concerned.

·TEST · DATA·

·SECURED · ON · COOLING : SYSTEM · IN · J·H·KITCHEN · RESIDENCE- KANSAS · CITY · MO·

DATE	TIME	OUTSIDE DRY BULB TEMP.	OUTSIDE WET BULB TEMP.	OUTSIDE "EFFECTIVE" TEMP.	INSIDE DRY BULB TEMP.	INSIDE WET BULB TEMP.	INSIDE "EFFECTIVE" TEMP.	DIFF. BET. OUTSIDE AND INSIDE IN DRY BULB	DIFF. BET. OUTSIDE AND INSIDE IN "EFFECTIVE"	WEIGHT OF ICE MELTED DURING RUN - IN LBS.	WATER TEMPERATURE	AIR TEMP. AT SUPPLY REG.	·NOTES·
JULY 17, 1932	1:30 PM	92½°	71°	80½°	78°	70°	74¼°	14½°	6¼°	800	38°	71°	COOLING FIRST FLOOR ONLY. PUMP AND FAN STARTED AT 11:00 A.M.
	2:30 "	93½°	71°	81°	80°	70°	75°	13½°	6°		41°	72°	
	5:00 "	94°	71°	81¼°	82°	70°	76°	12°	5¼°		45°	72°	
	7:00 "	93°	71°	80¾°	84°	73°	78°	9°	2¾°		54°	75°	ICE ENTIRELY MELTED AT 6:30 PM.
JULY 18, 1932	1:00 "	93°	70°	80½°	—	—	—	—	—	400	—	—	COOLING FIRST FLOOR ONLY.
	2:00 "	94°	70°	80¾°	—	—	—	—	—		—	—	PUMP AND FAN STARTED AT 1:00 PM.
	4:00 "	96°	70°	81⅜°	82°	69°	75¾°	14°	5⅝°		45°	72°	
	4:30 "	95°	70°	81°	81°	70°	75°	14°	6°		46°	73°	
	5:00 "	94°	70°	80¾°	82°	70°	76°	12°	4¾°		56°	73°	ICE ENTIRELY MELTED AT 5:00 PM.
	5:30 "	93½°	70°	80½°	82°	70°	76°	11½°	4½°		62°	74°	
	6:00 "	93°	70°	80⅜°	82°	71°	76½°	11°	3⅞°		64°		
	6:30 "	92½°	70°	80¼°	82°	72°	77°	10½°	3¼°		66°	76°	
	7:00 "	92°	70°	80°	84°	73°	78°	8°	2°		68°	77°	
JULY 19, 1932	3:30 "	96½°	72°	82°	83°	71°	77°	13½°	5°	600	52°	73°	COOLING FIRST FLOOR AND 1 BED ROOM ON SECOND FL.
	4:00 "	97°	72°	82°	82°	71°	76½°	15°	5½°		52°	74°	FAN STARTED AT 1:00 PM. PUMP " " 2:00 "
	5:00 "	96°	72°	81⅜°	82°	71°	76½°	14°	5¼°		48°	74°	
	6:00 "	95	72°	81½°	82°	71°	76½°	13°	5°		48°	72°	ANOTHER BED ROOM & 2 BATH ROOMS TURNED ON AT 6:00PM.
	7:00 "	94°	72°	81¼°	85°	71°	76¾°	11°	4½°		48°	72°	LIGHTS ON - DINNER SERVED AT 7:00 PM. - 5 PEOPLE
	7:45 "	90°	72°	80°	84°	72°	77¾°	6°	2¼°		48°	73°	ICE GONE AT 7:45 P.M.
	8:30 "	89½°	72°	79¾°	85°	73°	77¾°	6½°	2°		58°	75°	

General Notes

1. Outside dry and wet bulb temperatures listed above were taken from U. S. Weather Bureau Records. These readings are secured on roof of 13-story office building. Actual temperatures surrounding house were materially higher due to radiant effect of pavements and sidewalks. Actual temperature reduction therefore greater than indicated.
2. Water temperatures given for tests 1 and 2 (July 17th and 18th) unreliable since return water discovered short circuiting to pump suction. This condition was corrected for test 3 (July 19th) with baffles.
3. Cooling unit insulated with ½-inch Celotex. Furnace covered with 1-inch asbestos. No insulation on connecting duct from cooler to fan to furnace. No insulation on distributing ducts from furnace to rooms.

Test data checked by Wm. J. Klingberg, Engineer.

The need for cooling equipment and increased indoor comfort is accentuated by the outside temperature and the wind velocity, or if lack of wind movement occurs.

Today is cloudy with pronounced increase in wind, coupled with ninety degree outside temperature, makes it unnecessary to operate the cooling plant. Should the clouds break away, then it may prove necessary to start the plant for a few hours. All that is then necessary is to phone for ice and the cooling plant can be started "pronto."

We have noted on the chart the official weather bureau temperatures. Conference with the head of weather bureau indicates their temperature as recorded, fourteen floors above street, are lower than on or near the street level. Outside temperatures taken at residence indicate higher temperatures two to five degrees than weather bureau. Hence actual cooling secured is more than shown on chart.

Comfort Cooling For Homes

Cooling With Ice

By H. J. Macintire

A Series of articles discussing the basic principles of cooling and the application of present equipment and methods now in use

IN the first part of this series of articles on comfort cooling for residences, the general problem was outlined and methods of obtaining comfort were suggested.

In the second article a typical small residence was taken, and calculations for the comfort cooling load were made, with suggestions as to how a reduction of the refrigeration could be accomplished. In the present article the actual refrigeration will be restricted to ice.

The greatest obstruction to the application of comfort cooling is the first cost. The fact that in order to provide control of the house temperature and humidity by means of a machine means a machinery installation which may cost as much as $800 to $1,000 for a period of four months during which time it may not be in operation more than 60 days is an objection hard to overcome in a vast majority of cases.

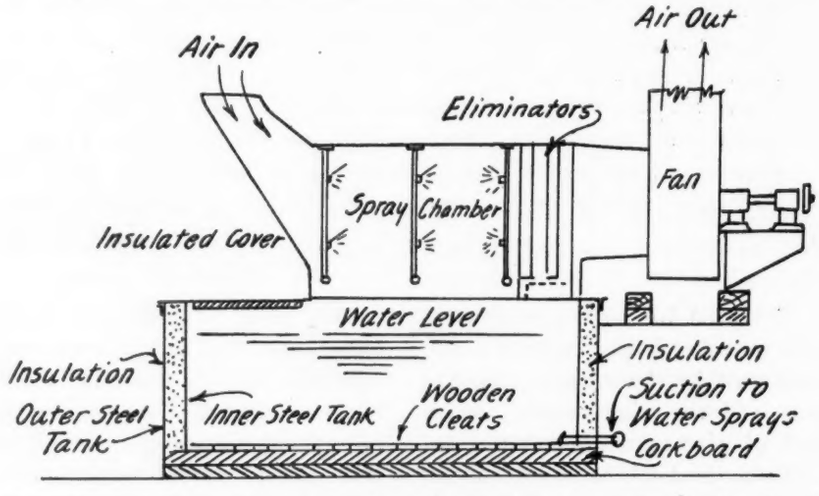
The average residence costs about $6,000 which makes a capital investment of $800 for four months comfort practically absurd. For such cases as well as commercial enterprises which require short periods of comfort cooling per day, the answer is in the use of ice where ice can be supplied in reasonable amounts at from $4.00 to $5.00 per ton. Undoubtedly costs are dependent on the demand, and, as numerous examples have shown what mass production will do, future installation costs will be governed by the extent of the desire for comfort in the summer. At the present time a small unit cooler, having a capacity for 75 pounds of ice and supplied with an electric driven fan may be purchased for $42.50. Such a unit, however, is designed for the cooling of a very small room as well as the lowering of the humidity. Very naturally the amount of cooling to be secured is limited to the latent heat of fusion of the amount of ice melted, or to 144 B.t.u. per pound of ice.

The Central Unit

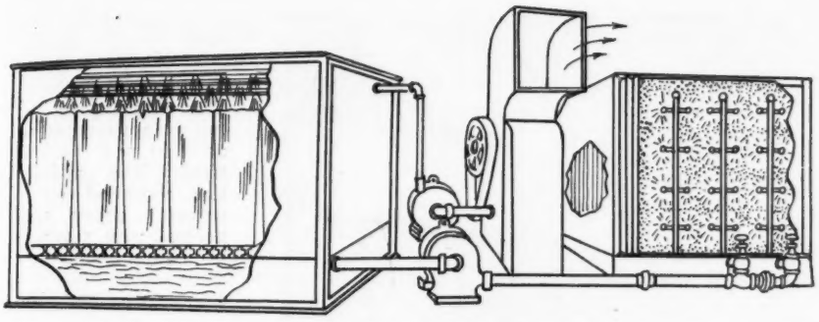
For the purpose of cooling the whole residence it has been assumed that the stacks and outlets of the regular warm air furnace heating system will be used with the addition of a motor driven circulating fan. If the fan is installed for comfort cooling undoubtedly it can be used for forced circulation of warm air during the heating season, in which case a more positive supply of heat is possible, remote rooms can be heated more readily, and the pipes need not be given the slope required of gravity systems. The fan may be the only required piece of machinery if so desired although in most cases the spray chamber with water pumps to the sprays is found to be more satisfactory.

The ice storage tank, *Fig. 1*, should be large enough to hold the required amount of ice during the day of 24 hours. It may be of very simple design or the more complicated one shown in the figure. In this construction there are two steel tanks, the inner one resting on corkboard and the space between the tanks filled with granulated cork. The inside of the inner tank should be protected by means of a wooden mat to prevent injury to the tank from a heavy fall of ice cakes. The insulation of the tank is an important matter. There are periods during the summer when the cooling plant is not required and this may amount to half of the days in the summer months of June, July, August and September.

Frequently cool spells may continue for three or four days. If the



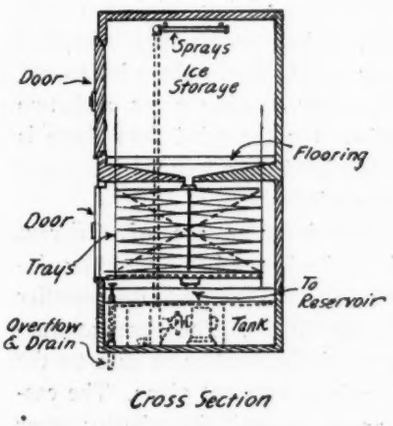
This diagram shows the construction of a typical ice cooling unit. Ice is partly submerged in the melting water, with the air passed through ice water sprays, and then through eliminator plates. There can be and are many variations of this design



This more elaborate ice unit is suitable for large installations such as restaurants, churches or any place where there is a heavy peak load period. The size is determined by the amount of ice which must be melted

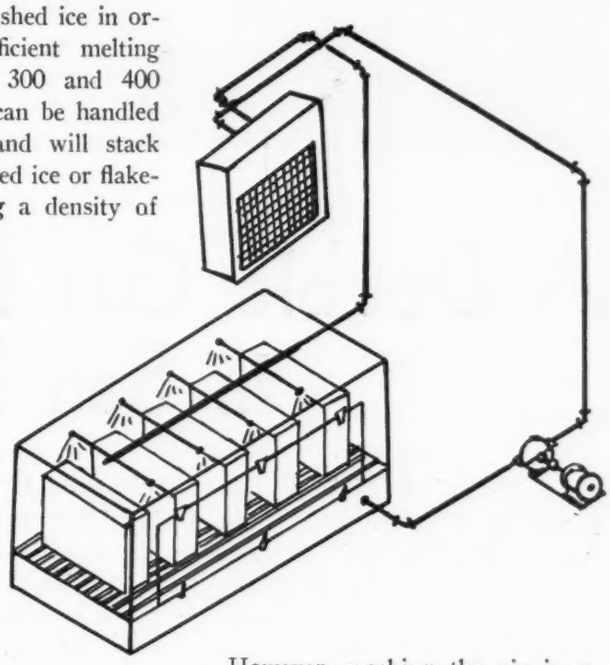
tank is well insulated the unused ice will be ready, with slight loss, for the next warm period. The insulation will prevent, also, the wet outside condensate condition which would otherwise make the ice tank an impossibility. The cost of operation is thereby reduced for when comfort cooling is required the only essential is to turn on the fan and the pump. The ice tank construction may be changed by the use of double layers of matched lumber with waterproof paper between. The spray chamber should be galvanized in order to prevent rusting.

Fig. 2 shows a slightly different arrangement, with water sprays over the cakes of ice. Fine jets of water, although they have been successful, may melt holes in the ice thereby making subsequent cooling more difficult unless the rack is inclined so as to make the ice feed downward. Finely divided sprays are preferable. The advantage of the spray system lies in the high value of the coefficient of heat transfer between the water and the ice. *Fig. 1* calls for the ice to be partly submerged without the use of sprays. Such a system requires the use of broken or crushed ice in order to provide sufficient melting surface. However, 300 and 400 pound cakes of ice can be handled more economically and will stack better than will crushed ice or flake-ice, the latter having a density of from 35 to 50 pounds per cubic foot, as compared with 57 pounds per cubic foot for ice in cakes.



This cross section shows a portable unit with sprays rather than direct air to ice transfer

Ice cooling can be sold in places where there is no central warm air plant by using a unit heater for the cooling element. Each unit must have its own fan. Such systems are excellent for radiator heated shops.

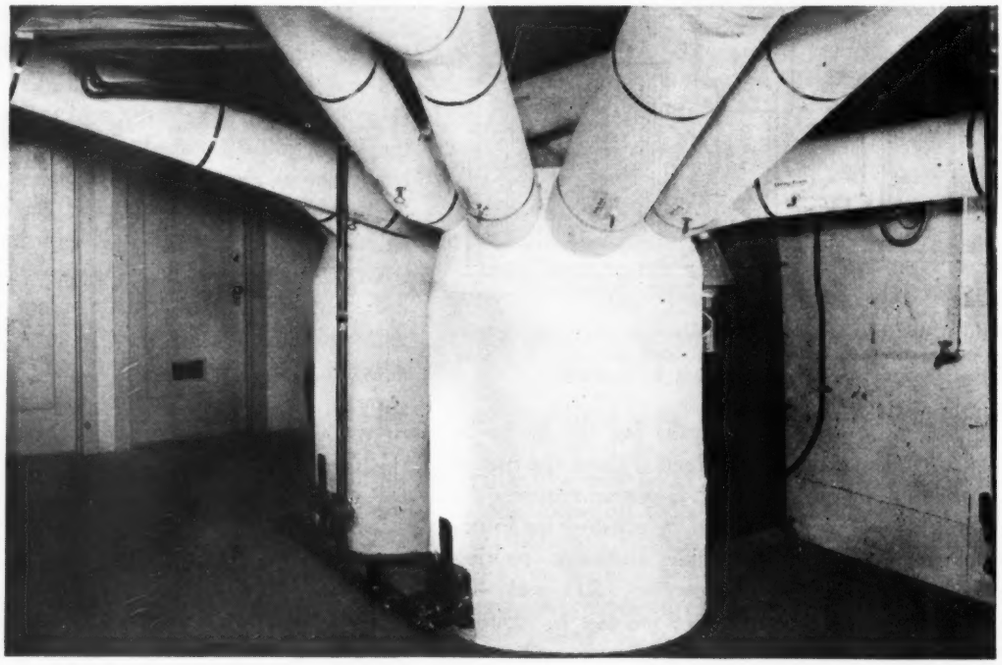


There is no reason why a spray chamber is absolutely necessary although the humidity will probably be lower if one is used with the proper amount of eliminator surface. If the air is drawn through the ice chamber by means of a fan and then circulated through the duct system of the house the design will be simpler but the ice surface will need to be greater than in the other cases, in order to cool the air to the same temperature obtainable in the designs shown in *Figs. 1* and *2*.

If the warm air ducts are not available in the residence a modified system may be constructed as is shown in *Fig. 3*, where only one unit is shown, but other unit coolers may be installed in series wherever desired, or where the cold water lines can be installed. The unit cooler shown may consist of a series of thin coils with the fan on the rear side in which case it is called the dry method because the water does not come into direct contact with the air. This method is quite effective, if the water is cold enough, although there is no means of washing the air as in the case of the spray system.

However, washing the air in a residence, except in the case of excessive smoking, is not usually required if the kitchen has been properly vented. The air is dehumidified when the water is sufficiently cold to cool the air below the dew point of the air. The condensed moisture has to be drained off in some satisfactory manner.

There is also the floor type of unit cooler which usually uses water sprays combined with moisture eliminators, designed to take the air from near the floor and deliver it at a reasonable velocity horizontally near the ceiling. These units can be placed in the wall, with the register faces flush with the wall surface. Provision must be made so that access to the pipes and the fan is possible.



The appearance of the twin furnaces is all that can be desired. The casings are covered with asbestos paper and painted with a white water paint

Below is an exterior view of the house. The back or garden side commands a sweeping view of the bay

A Double Gas Furnace Installation in San Francisco

IN San Francisco and the adjacent area on the west slope of the mountains, heating is not quite the problem it is in the colder and dryer northern states of the middle west and east. On the west coast some heat is required in the winter months, but temperatures of zero are seldom experienced and the weather might be called disagreeably damp rather than cold.

To make homes comfortable just about as large a percentage of owners use warm air on the west coast as farther east. Their heating systems, however, do not have to carry the load ours do and so are not designed for the wide temperature differences commonly figured on east.

The illustrations with this article show the exterior of a handsome house in the San Francisco suburban area and the heating plant which serves the house. This particular plant has two gas fired furnaces and a propeller fan hooked into both casings.

This heating plant serves eleven rooms and two baths as follows: First floor—living, dining, breakfast, maids' rooms and reception hall; second floor—three bedrooms, a nursery, sewing room and two baths. On the third floor there is a special living room with many large windows.

The furnaces are of different sizes, the larger having a B.t.u. input of 151,000 and the smaller 70,000 B.t.u.'s. The clean appearance of the heaters is due to the finishing treatment given. The casings are covered with asbestos paper and the warm air pipes with ¼-inch

(Continued on page 47)

FAN BLAST ENGINEERING

by PLATTE OVERTON

How Many Inlets?

"WITHIN practical boundaries, it is impossible to provide too many supply inlets or return or exhaust openings in any given area that is to be air conditioned. The more inlets the better."

This statement has been made and repeated several times previously. For example, any attempt to efficiently air condition the living room of the bungalow shown in Fig. 1 is akin to attempting to water a lawn 150 feet square with one sprinkler on any one side. It is true that if the sprinkler were placed in the direct center of the plot and the velocity of the water were high enough, results over the entire lawn might be obtained, but in air conditioning openings directly in the center of the room, in the floor or ceiling are generally impossible. Also, too high a velocity at the inlet will be objectionable.

Air Change

We frequently hear the expression "10 minute air change" or "7½ minute air change," this referring to the air change in some given area to be air conditioned. Authorities may not agree on the exact velocity of the conditioned air over the occupants of this area, as pertains to perfect air conditioning results, but it can be said that a ten minute air change refers to a complete change of air every ten minutes over the entire area of the room or space to be conditioned.

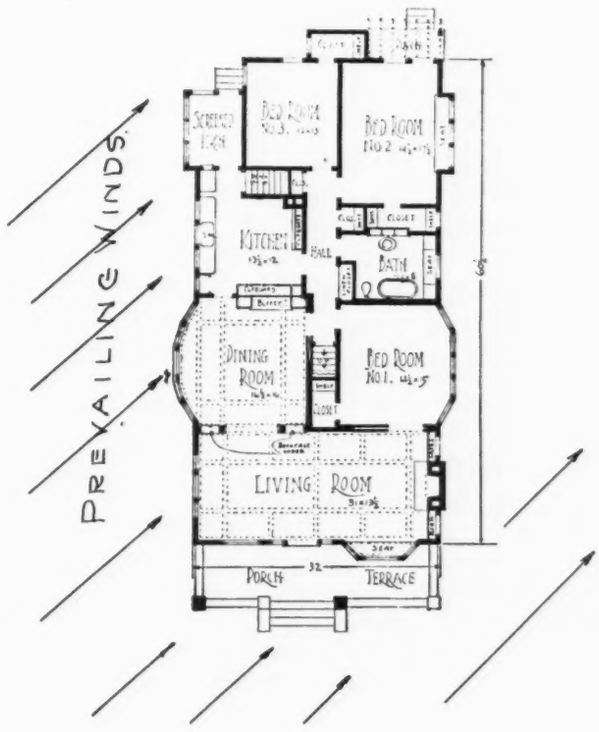
The living room in the plan of Fig. 1 is 31x13½x9 feet or a cubical content of 3,767 cubic feet. A ten minute air change will require 377 cubic feet per minute, and unless the supply inlets and returns are multiple and well arranged it is possible that this air change may take place in one end or side of the room only. So much for good distribution. Now how about heating, uniform temperatures, and elimination of drafts?

Air Like Water

If we think of the air stream which leaves the grille as a spray of water from a hose nozzle we can visualize how impossible it is to get full room distribution when there is an opposing wind. If we know a room couldn't be saturated with one nozzle then the chances are that room can't be uniformly heated by one inlet.

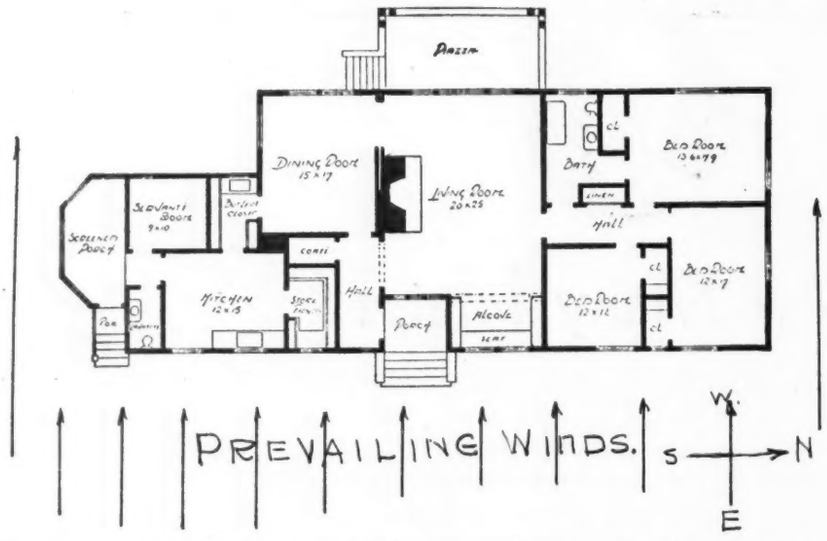
While it may seem apparent that this bungalow in Fig. 1 is an extreme case as regards glass area and exposure, it may be said to be typical for buildings of this type. The owner required plenty of light. He got it; accompanied by inherent high heat loss and infiltrations. No doubt about air change here. This room will have a 15 or 20 minute air change without any mechanical means necessary to move the air. But the change will be from "outside to inside." During the heating

FIG 1



The living room and dining room of this house are typical of present day design. Casual observation should show how impossible it will be to maintain uniform temperatures in these two rooms with one register. The satisfactory solution lies in using just as many registers as the selling price will permit —the more the better

FIG 2



This house has the living room and dining room well protected against prevailing winds. If these rooms are to have uniform temperatures at least three inlets or three outlets must be used to offset the area of low pressure which will be present

season this outside air will be below room temperature.

If we place a large return register face on the floor of the living room on the south wall near the bedroom closet, we are inviting disaster. With such an arrangement the heating contractor should furnish the occupants with fur-lined boots and footstools for each chair. The natural draft would of course make this location of the return air opening highly efficient. In most cases natural drafts are to be avoided in air conditioning system. Air conditioning is an attempt by Science to overcome the actions of nature. A good measure of Science and no little cleverness are necessary on the part of the designer to correctly design air conditioning warm air systems if they are to survive.

Placing Inlets

In the writer's opinion, three warm air inlets in this living room (Fig. 1) combined with three returns would be a minimum. The dining room should have not less than two inlets with possibly one return. Any of the balance of the rooms would require but one warm air inlet and one return each.

Fig. 2 offers us the problem of the living room crossing through the center of the entire house and the prevailing winds from the east. One large inlet opposite the fireplace offers the cheapest method of warm air inlet, but should be the very last one to be recommended for good distribution, uniform temperatures, or elimination of uncomfortable drafts. Here again is a situation where less than three warm air inlets combined with possibly one return is necessary.

The dining room is well protected and in such a room one outlet on the east wall should give the desired results. The balance of the rooms may be successfully air conditioned with one supply inlet and one return, with the warm air inlets below the windows in the two bedrooms on the east side of the house.

Note that we say one inlet for these rooms. However, if the warm air inlets are high in the side wall and the partitions will accommodate only 3½-inch stacks, 200 c.f.m. is a maximum for a 14x3½-inch stack, and if the requirements exceed 200 c.f.m., two smaller stacks should be used and placed to the best advantage.

Low Pressure Areas

Fig. 3, a 1½-story bungalow, offers the direct opposite of the conditions found in Fig. 1 and Fig. 2. Here the living room is well protected from the prevailing winds blowing from the northwest. The dining room on the first floor and the west bedroom on the second floor offer serious problems of uniform temperatures and elimination of cold drafts due to the exposure and relatively large glass areas.

This plan requires some analysis regarding the location of returns. With the average trunk line system without individual room control, the air supply to the living room will be less compared to the cubical content than the supply to the dining room. Let us say that we have a 12-minute air change in the living room and a 6-minute air change in the dining room. Add to this 6-minute air change the change due to infiltration. It is obvious that our living room is our low pressure area and, regardless of the number of return faces in the dining room, the arched way (5 by 8 feet) to the living room will become our real return opening with a natural draft or movement of air from the northwest to the southeast across the living room. The draft or movement of air would be increased by locating returns that were oversized on the south wall of the living room.

Drafts

Due to the higher pressure in the dining room, this air movement will be maintained regardless of other conditions. This air may be hot, cold, or temperate. As we cannot eliminate this condition with the single trunk line and no control of inlet temperature, our only solution is to warm this air and reduce it as much as possible in volume. The latter may be accomplished by liberal returns in the dining room, and the former by locating our warm air supply inlets to warm the outside air entering by infiltration. This may be accomplished in several ways, but inspection of the room in question would seem to place them in the window seats on the exposed side of the room.

The west bedroom on the second floor would require two or more high velocity grilles on the east or

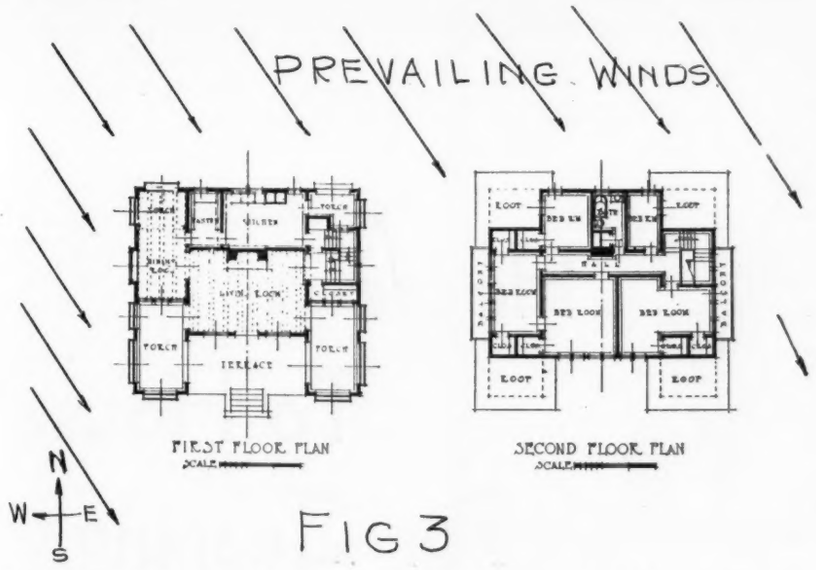


FIG 3

In this small house the dining room will have high pressure while the living room will be in a low pressure area. To maintain even temperatures under these conditions more than one register must be used

inside wall. The stream of warmed air directed on the large glass area would prevent condensation and counteract "cold 70°."

The northwest bedroom, while small, has two large windows and is located in the most exposed area. Inlets below the windows are possible with risers through the pantry.

Where possible, every bedroom should have a return. This will prevent uncomfortable drafts in the area of the open stairway and stair hall.

In general, inlets should work with air pressures. In other words, if prevailing winds are against the outside wall, then the inlet should be placed in that wall. If the room is an inside one, place the inlet to the side nearest the prevailing winds.

The return systems in both Fig. 1 and Fig. 2 will no doubt be expensive, but the house in Fig. 3 lends itself to simple and efficient returns. The face of the linen closet at the floor line makes a splendid return from the rear hall and accommodates the three bedrooms. The rear of the coat closet in the front hall could be elevated 12 inches and a grille placed in the base of the closet door for the return from the living room. An opening from the dining room to this same return and our returns are complete.

Distribution Essential

The two basic reasons for multiple warm air inlets are distribution or diffusion and the various locations to assure the flow of warmed air over exposed and highly conductive surfaces such as outside wall, doors, and windows. With the application of a good diffuser we may accomplish distribution and diffusion with one inlet centrally located. Such a warm air inlet is shown in Fig. 4. This inlet, if properly located, may give superior results to that obtained by two inlets as shown in Fig. 5. The objection to the warm air inlet in Fig. 4 is that it projects into the room. However, it can be made small, or possibly arranged in a light fixture.

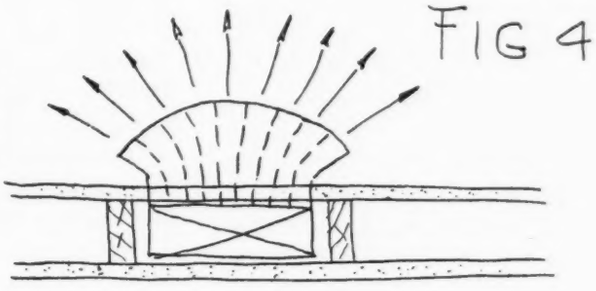


FIG 4

A good diffuser-register guides air all directions from the face. Where such a face is centrally located, good results are obtained

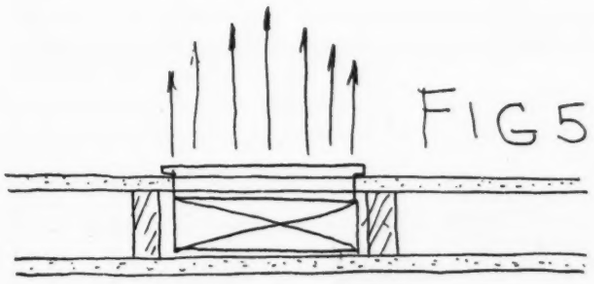


FIG 5

Without diffusers, warm air tends to hold together, rising or falling in column until velocity is lost

Fig. 6 is a warm air inlet in the ceiling above an inverted lighting fixture. The inlet is concealed and good diffusion is assured. Such inlets are easy to install if the room has suspended ceilings.

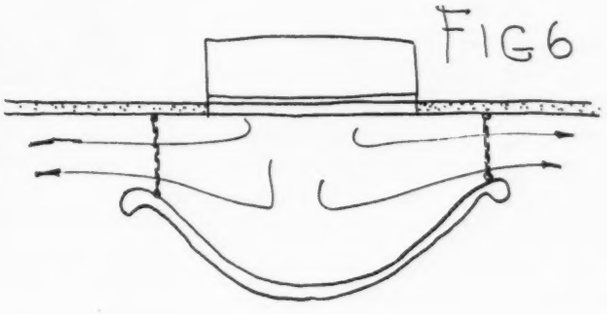


FIG 6

Many engineers place inlets in ceilings concealed behind plaques or fixtures. This is not always possible in homes but may be a future development

House To House For Cleaning Orders

W. E. HALL & SON, Grand Rapids, Michigan, is a father and son organization in which both members of the family are actively engaged in furnace and sheet metal contracting.

In 1931 this firm established an enviable record in a furnace cleaning campaign which was based on personal solicitation by the firm members and not on any tricky or flashy schemes which have been making house to house canvassing a nuisance in many cities.

The campaign was begun in the late winter and early spring so that by the time the furnaces were shut down for the summer most of the city had been covered.

Just under 400 furnace cleaning orders were taken.

Both father and son personally called on the home owners. In explaining their service, the fact that the members of the firm were calling, setting the price and stating exactly what would be done seemed to bear most weight with the owners.

The first step in the program was the selection of prospects. Old customers from the firm's books were listed first. Then came former prospects, friends whose names were given by customers, owners that someone in the firm knew something about. Calls were made on these people first because the firm decided that other cleaning agencies would certainly call on them sooner or later and the Hall company should tell its story first and reestablish itself in the customer's mind.

When these leads had been exhausted, the city directory was taken and the city mapped into districts. Names of people by street addresses were copied out and arranged into convenient daily working lists. These daily lists were gradually extended until the city had been covered.

The canvassing talk which was used was worked out from day to day experiences. All useless conversation was eliminated so that the story could be told in a few minutes and told in a way which would hold the owner's interest.

A pleasant "Good morning" or "Good afternoon" was used to greet the owner when the door opened. Following this the statement was stressed that the solicitation was not being made by peddlers, but by a reputable Grand Rapids firm and that the service which the salesman would like to explain was an essential service which would save money. This short greeting usually secured

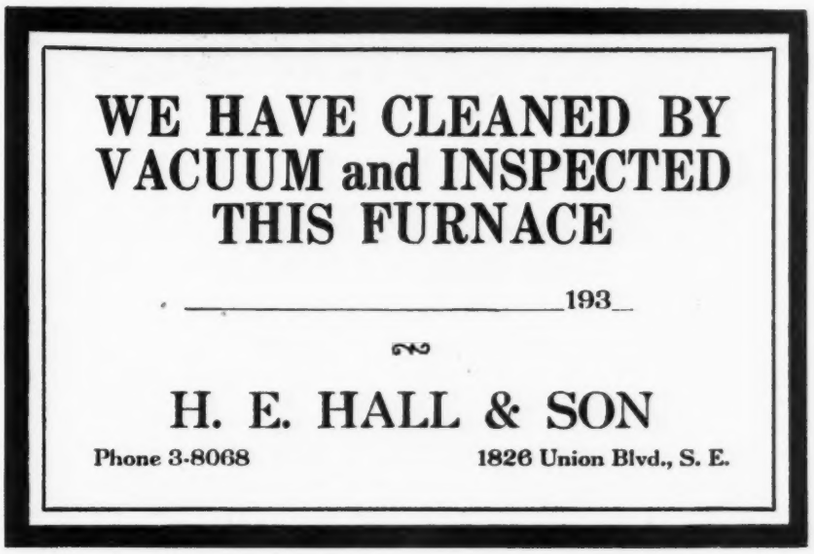
This is the advertising side of a four-page mailing card 3¼ by 5½ inches. The reverse side carries the mailing address. A third side provides spaces for the prospect to check the time he wants the salesman to call or to ask for an estimate

entrance into the house or at least time for further explanation.

The canvass from this point on stressed how cleaning removed harmful collections of dirt, that cleaning resulted in a very definite saving in fuel bill because a clean furnace operated more efficiently and that cleaning as Hall does it eliminates dirt which brings wall, curtain and furniture smudges.

The solicitation was worked out so that at this point the prospect might order the cleaning job done at once or ask for time to think the proposition over. In either case further time and useless talk were saved.

If the owner wanted time to think or could not make the decision an offer to call back again was made. If the owner was not at home a card was left and a notation made on the call sheet showing that no solicitation had been made at that address.



This sticker is black type and border on a orange background. The sticker is placed in a conspicuous place on every furnace the Hall company cleans. Repeat orders have been traced to this reminder

Early in the campaign the firm established contact with a popular coal merchant and a hardware dealer whereby these merchants collected a percentage on all work turned over to Hall. This contact brought in considerable business.

This is another sticker which is pasted on the furnace or on a wall, beam or post near the furnace. It is used on new jobs, on repair jobs and on clean-outs. The type and border are black on dark yellow. The size is 2¼ by 3½ inches.

No trick offers have been made to date. No service or no item is offered free, but a good job at a satisfactory price guaranteed.

This price is a standard $4.00 charge except when the condition and size of the heating system warrant a larger price.

When a furnace cleaning job is completed the workmen place two stickers on the furnace. The first is a general advertisement of the firm's work and the second is to serve as a record of when and by whom the furnace was cleaned. These stickers have resulted in some repair and return cleaning work.

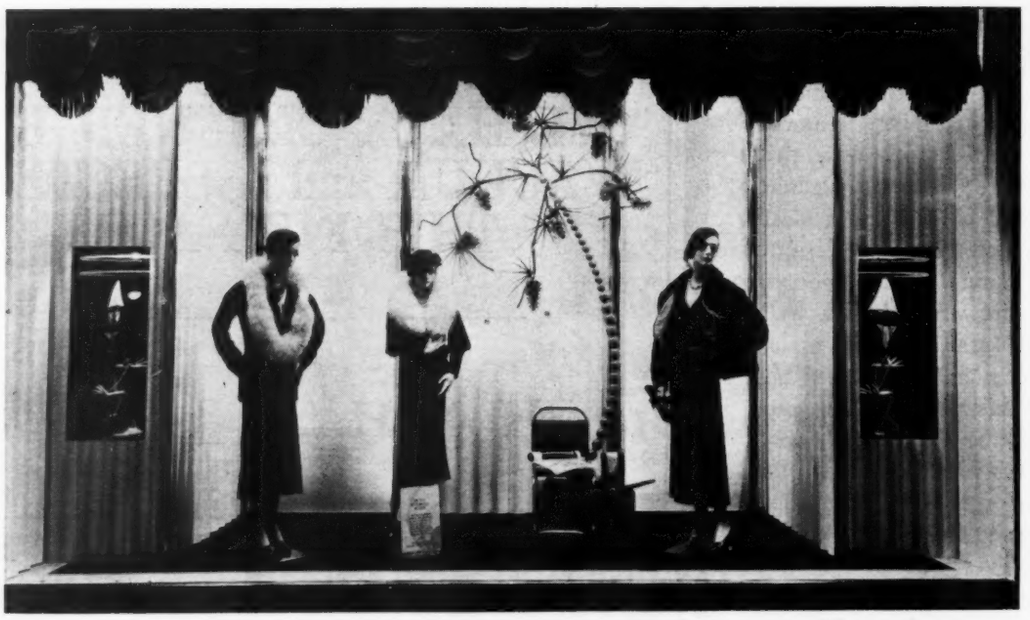
Direct Mail

In addition to this house to house canvassing, some direct mail efforts are carried on. One effort consists of a return mail card as shown. This card explains the service and provides space in which the owner can check off the service he wants information on.

The second mailing piece is a small card which can be put in envelopes in which bills, letters or any mailing matter are sent to customers, prospects or mailing list names.

Both members of the firm emphasize the point that their door to door solicitation has brought in the most orders and that they believe that the one thing in their canvassing talk which attracts attention is the statement that the solicitation is being made by a member of the firm and that Hall and Son are established Grand Rapids business men.

This card is used to mail with bills, letters, etc. It is also mailed to lists of names ahead of the salesman's call. The card is 3½ by 6 inches, printed in green and black



A typical Block window display with painted, fluted galvanized iron as the background material

Sheet Metal Wins Prizes As Window Display Background

IN Indianapolis, Indiana, the display windows of the Wm. H. Block Company have been considered so effective that the display men of the country awarded the designer, Augustus A. Roeder, several first, second, third and honorable award prizes during the years 1929 to 1932. How effective these windows are can be seen from the photographs of typical windows shown here.

In all these windows sheet metal has been used for the background. In some of the windows corrugated metal was used. In other windows flat sheet, formed suitably, was used. During this period, the metal has been used in natural finish, it has been covered with paper and fabric and it has been painted. Regardless of what finish was used the general effect has been so good that the prizes referred to have been awarded the designer.

It is related that the use of metal for display was adopted first by Mr. Roeder as an emergency measure when he was faced with the problem of getting a combination background and dressing room for an exhibit using a stage for display. He thought of sheet metal because it could be formed easily and would stand alone without intricate bracing and carpenter work. To get the combination he needed he called in Joseph Gardner, Sr., and explained just what was required. As a result of this conference the background and dressing rooms were fabricated in galvanized iron in short order and served admirably.

From this beginning it was only a step to the use of metal in the store windows. Working together Mr. Roeder and Mr. Gardner designed a series of windows in which corrugated and flat sheets were combined for backgrounds. In some of these windows the sheets were covered with paper; in others the metal was covered with fabrics of varying textures and colors; while in still others modernistic paint color combinations were developed.

In every case the metal proved a material which made formation quick and easy and eliminated the bracing which presents a problem to the designer faced with restricted

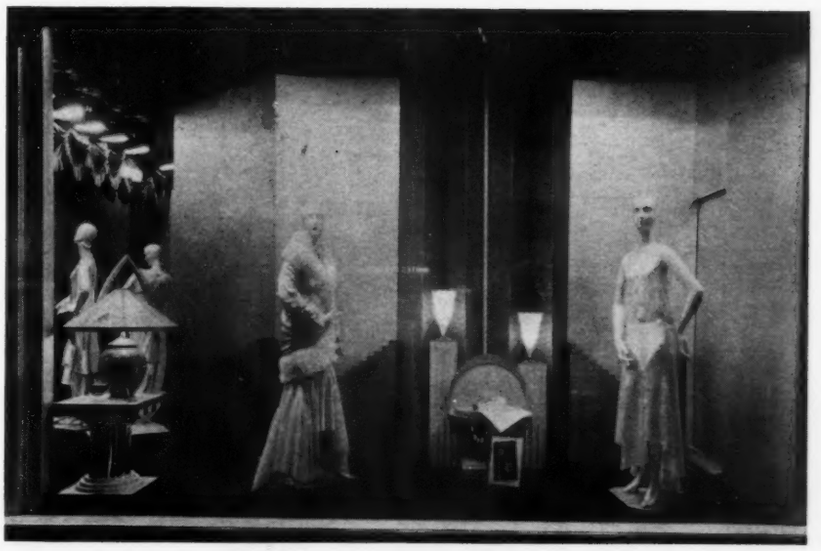
"I believe that sheet metal is the most substantial, as well as practical, material that can be used in display windows. It can be used in its natural finish; it can be covered or painted to give any desired color effect; and it can be formed to any design required with less effort or expense than other materials.

"The windows which I have designed are proof of what can be done with metal. The fact that these windows won medals for display is further proof of metal's adaptability and beauty.

"I give much credit and praise to the skillful genius of Joseph Gardner, Sr., for my success with metal. I believe that display men everywhere can solve a good many of their problems if they will find a skillful craftsman in metals and work out their displays with him."

floor space. It was found that metal also provided an excellent base for the application of any material from paper to paint which Mr. Roeder desired to use.

During the last few months many of the new metals have been used. Dull finished and bright metals have been used in combination with other metals. Glass has also been worked into these backgrounds as shown in the pictures. Mr. Gardner reports that in spite of the fact that these metal trimmed windows have now been in use for more than three years the possible combinations have not been exhausted and that as the use of metal has gone along new combinations and forms have developed until there seems no end to the possible treatment.



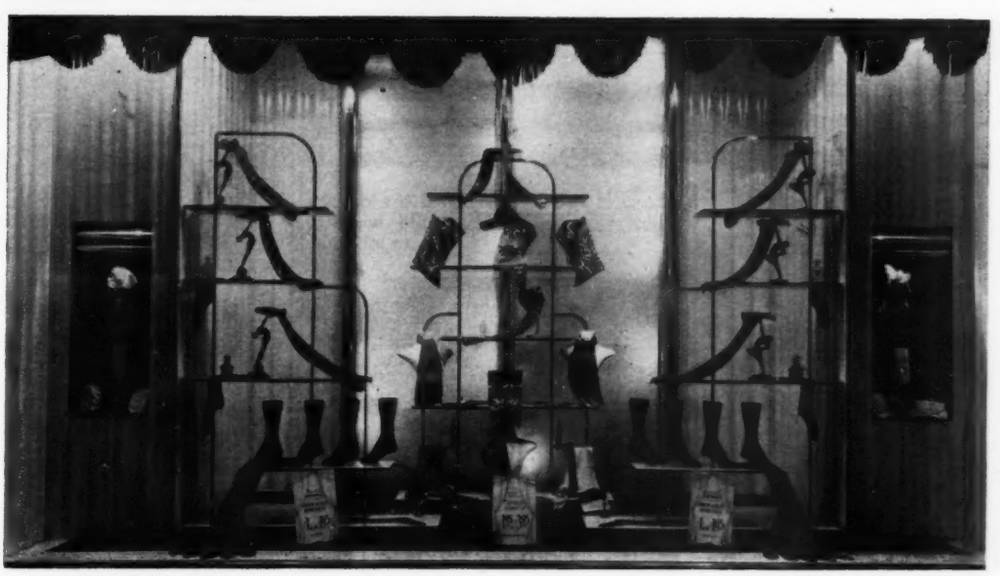
Another display of flat sheets and small, bright metal accessories. Jos. Gardner fabricated the sections

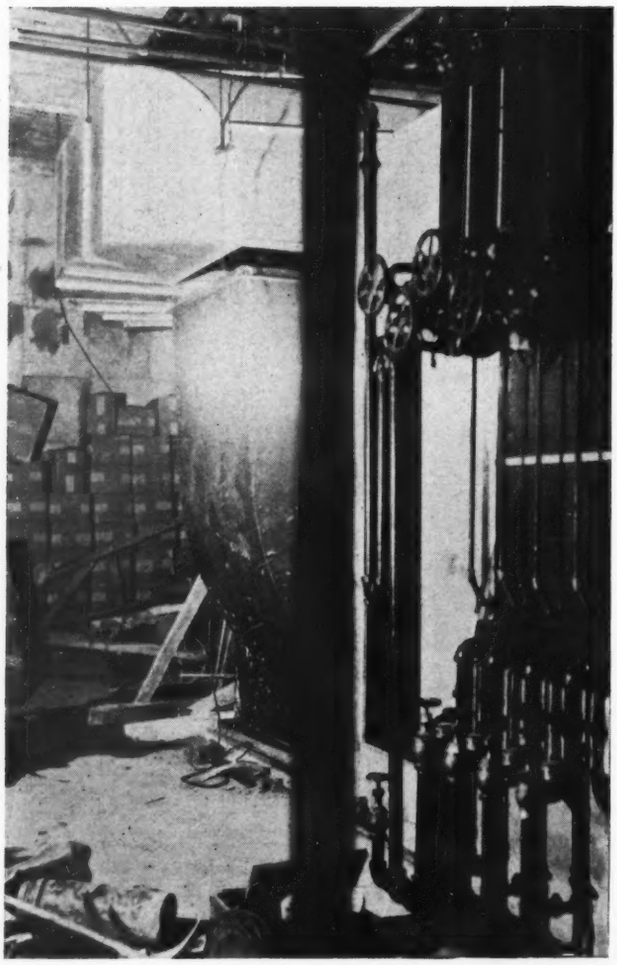
If you want proof of metal's possibilities, this collection of prize awards won by Mr. Roeder for his metal trimmed windows should be proof enough.

Mr. Gardner is just as proud of this work as is Mr. Roeder. The development of the idea has given Mr. Gardner opportunity to show how vast are the possibilities of metal when the metal man has free play for his imagination and skill.

This work has not been produced in volume, as can be realized. Nevertheless, the work has filled in off moments in the shop operations and has proved profitable. Mr. Gardner suggests that any competent mechanic equipped to handle sheet forming operations may be able to interest some local store having display windows in this use of metal.

Below is shown an accessory display in a "white window." The background is chrome metal, waved, and glass





An Attic Plenum Ventilating System

Above is shown a view of the exhaust fan in the basement and the heating coils which will be used in mild weather. The lower photograph shows the attic plenum chamber with exhaust heads

DURING the past twelve months a number of school buildings have been remodeled or built by the Milwaukee board of education. And because Wisconsin has long had a school ventilating code, each of these buildings has a rebuilt or completely new ventilating system, most of which are of the "split system."

A typical installation of the type used by Milwaukee is the Sixteenth Street grade school. For the installation some 40,000 pounds of galvanized iron were required for ducts, plenums, housings, etc. An interesting feature of the installation is the fact that one mechanic and one helper installed all the duct work. Practically every section and fitting was fabricated on the job with equipment designed especially for mobility.

Direct radiation is placed on the outside exposed walls below the windows and air at or above breathing line temperature is furnished for ventilation. A minimum of 2 cubic feet per square foot of floor area is maintained with an average of six air changes per hour. In mild weather it will be possible to heat all rooms supplied with air without the aid of direct radiation.

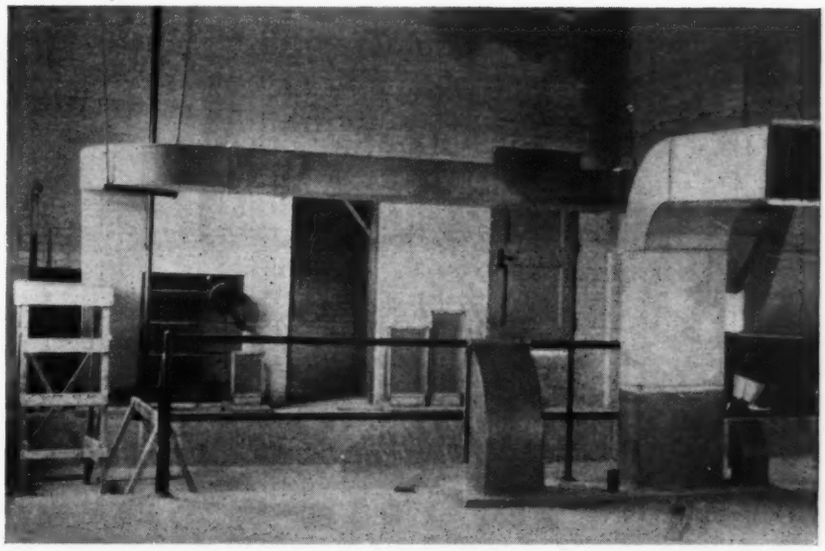
The arrangement of the system is known as the "draw-through," the fan drawing the air over the heating coils. The apparatus consists of air filters, blast coils, humidifier, temperature and humidity regulation and necessary ducts, stacks, air supply inlets, exhaust risers to attic plenum.

The fan is top discharge, directly connected to the supply trunk ducts, insulated against vibration by means

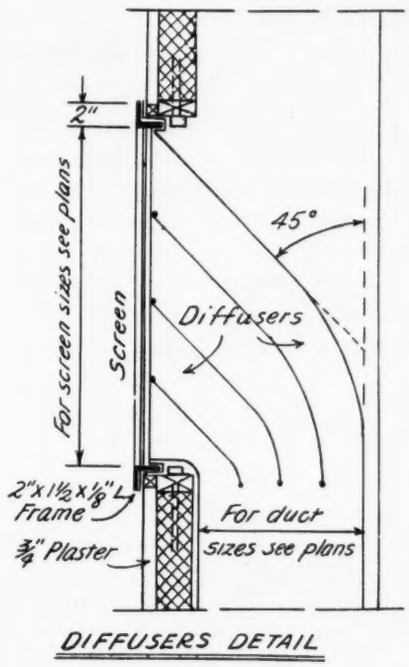
of canvas connections. The motor is 15 horse power belted to fan with Tex rope drive.

The main trunk duct is constructed with standing seam locks. The risers and small branches have flat seams "S" and drive cleat locks. The air supply inlets to rooms are equipped with diffusers built into the stack head.

One of the interesting items of the system is the use of the attic space over the corridors for the exhaust plenum. The exhaust plenum is shown in an illustration. The



The pent house has outside dampers in the back wall. From this room air may be recirculated, mixed, or exhausted to use outside air. The room opens into the attic plenum



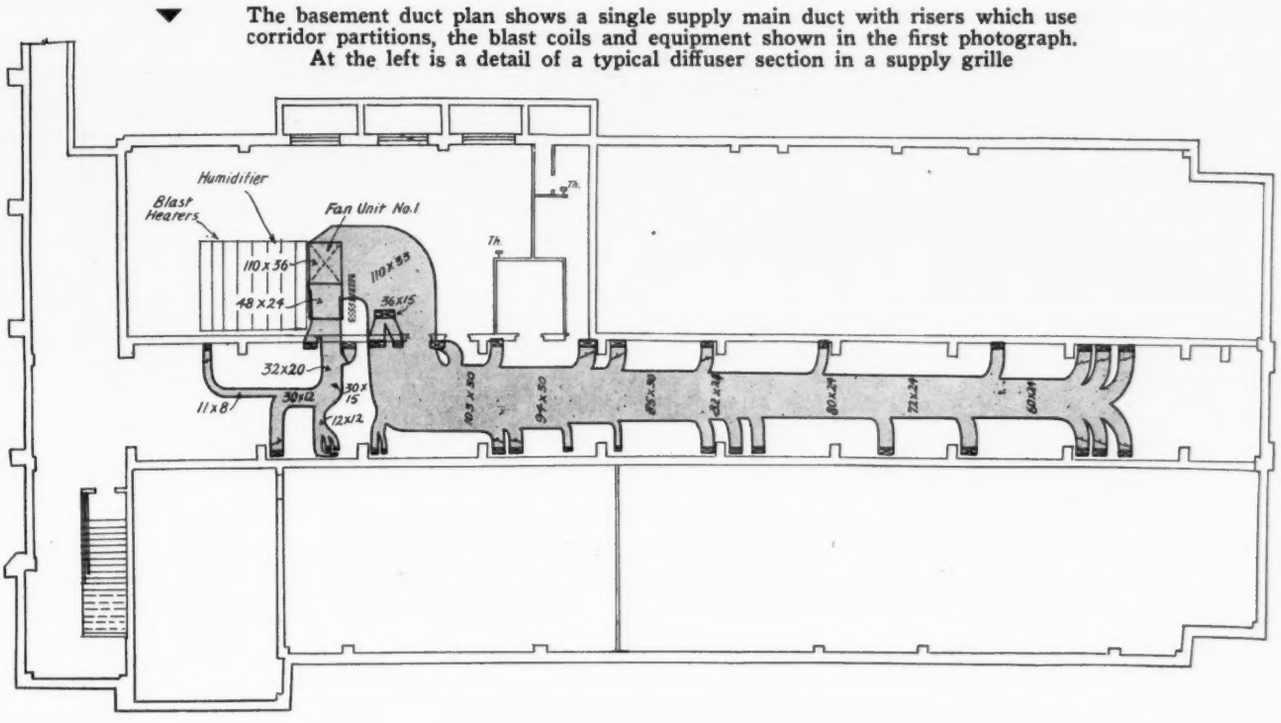
DIFFUSERS DETAIL

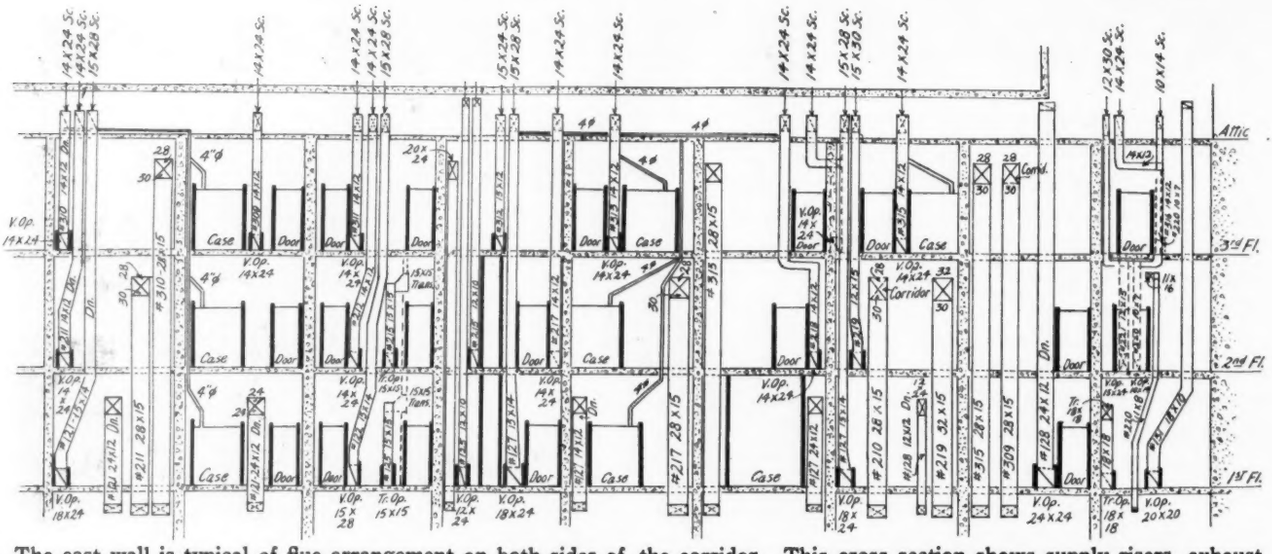
exhaust risers terminate in heads, elbow shaped, and are covered with ½-inch mesh, 12-gauge galvanized iron wire screens, set in 1¼x1¼x⅛-inch angle iron frames. The air is exhausted by gravity from the rooms to the attic plenum, thence to a pent house above the roof. The pent house has galvanized iron louvers. Large pneumatic dampers operated from a switchboard in the basement close the plenum space from the ventilating pent house, making it possible to recirculate or confine the air in the building at night.

The outside air intake rises to the attic and has a connection on one side to the exhaust plenum. This connection is equipped with pneumatic dampers to make it possible to recirculate all or part of the air.

The illustration of the exhaust plenum shows the toilet exhaust duct. All exhaust risers from toilets, laboratory cases, janitors' closets, etc., are directly connected to this duct that runs to the toilet exhaust unit. This unit is in a

The basement duct plan shows a single supply main duct with risers which use corridor partitions, the blast coils and equipment shown in the first photograph. At the left is a detail of a typical diffuser section in a supply grille





The east wall is typical of flue arrangement on both sides of the corridor. This cross section shows supply risers, exhaust risers and toilet exhaust

room walled off for this apparatus. The exhaust unit consists of a direct connected fan with 2 horse power slow speed motor.

Where supply ducts are concealed above ceiling, volume dampers are concealed in recesses covered with ceiling plates. A "V" shaped edge on the head of the supply duct or riser makes it possible to insert the angle iron edge of the supply grille and prevents the streaking of walls so common with the average application.

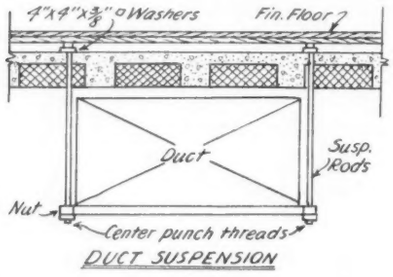
All risers are concealed in partitions, these partitions being laid up of tile after the stacks have been erected.

Trunk lines are designed for velocities of 1000-1200 feet per minute. Volume dampers are located in all branches near the base of the riser.

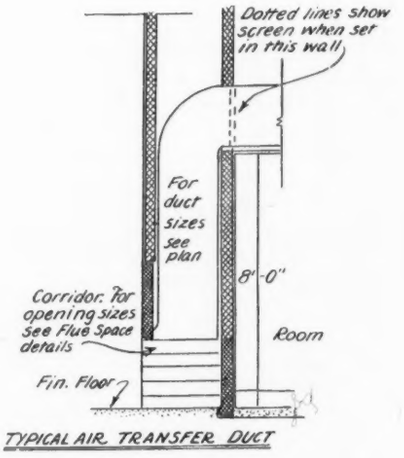
From the top of the fan at the discharge, a complicated series of fittings connect the fan to the trunk duct. Part of these fittings are shown in the side view of the coil casings.

Fans and motors are mounted on 4x6 frames with 3-inch plank floors and one inch of compressed cork.

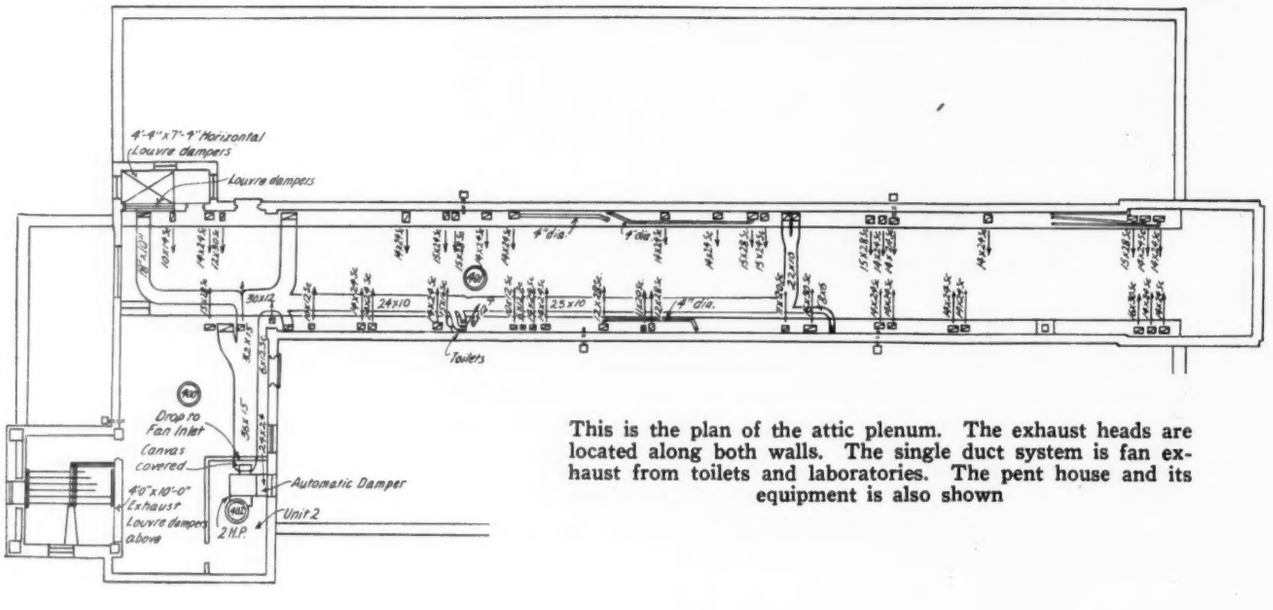
This system was installed under the personal supervision of Herman Roesler of Milwaukee.



Most of the supply ducts were hung like this. Ducts were fabricated on the job by one mechanic and one helper



Above is a detail of a transfer from corridor to class room duct section



This is the plan of the attic plenum. The exhaust heads are located along both walls. The single duct system is fan exhaust from toilets and laboratories. The pent house and its equipment is also shown

A Pattern For A Louvre In Round Opening

By L. F. Hyatt
Contributing Editor

THE pattern for a louvre for a round opening is one of interest and is rather simple to work out.

The method of parallel line development is involved in working out the pattern. The round ventilator is often used in various kinds of buildings.

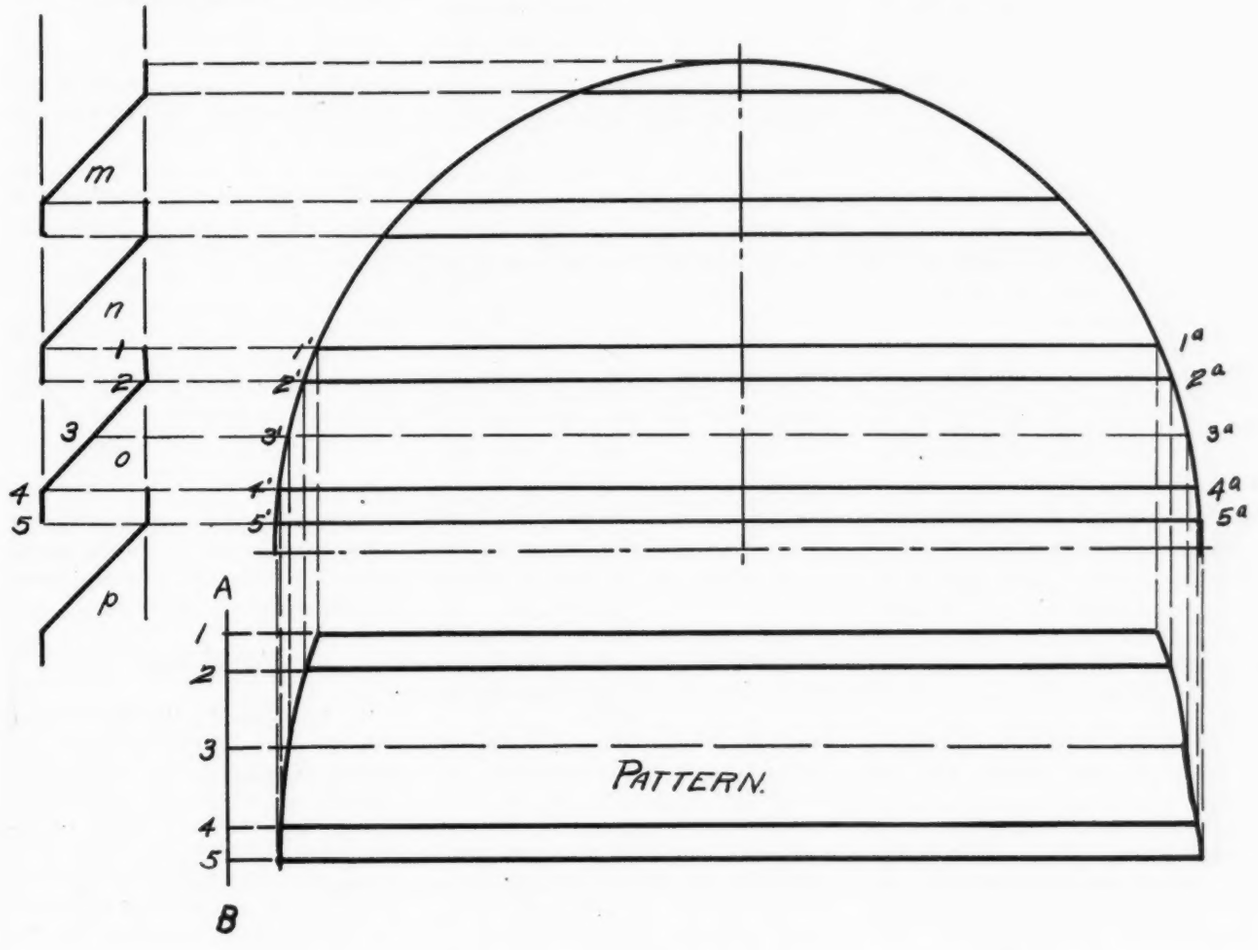
First draw the verticle and horizontal center lines and construct the circle representing the half of the opening into which the louvres are to fit. Next draw the profile of the louvres as shown by *m-n-o-p* and number the points on these profiles as shown by the numbers *1, 2, 3, 4, 5* on the louvre lettered *o*.

Then project lines from each of these points intersecting the circle on both sides, and number these intersections *1'*, *2'*, *3'*, etc., and *1ª*, *2ª*, *3ª*, etc.

Now draw the stretchout line *A-B* as shown by the vertical line *A-B* and upon this line step off the distances *1, 2, 3, 4, 5*, found upon the profile *o*, and draw horizontal lines of indefinite length from each of these points.

Next from each of the points of intersection *1'*, *2'*, etc. and *1ª*, *2ª*, etc. drop verticle lines intersecting the horizontal lines from the points *1, 2, 3, 4, 5* on the stretchout line.

Now through these points of intersection draw the lines which determine the shape of the ends of the pattern. We have developed the pattern of but one louvre, this same method being applied to the other louvres as well as the ventilator with the round corner, requested by one of the readers of the ARTISAN.



PATTERN FOR LOUVRE IN ROUND OPENING.

DISTRIBUTORS news

What Shall We Do About "Seconds"?

A report of the discussion on this important subject given by members attending the recent meeting of the National Association of Sheet Metal Distributers.

AT the recent meeting of the National Association of Sheet Metal Distributors, one of the most interesting discussions centered around the matter of improvement in galvanized sheets and the proper classification and handling of second sheets.

F. J. McNeive

The discussion was started by F. J. McNeive of W. F. Potts Son & Co. in his address. In his talk he said:

I feel that with conditions as they are at present and have been for the past year, that this is not an opportune time to ask the mills to make radical changes in policies that might benefit the distributors' business. I realize that the mills, like ourselves, have problems to solve, and serious ones, and whether we would like to admit it or not, the facts are that both groups are having to fight for their existence, with their backs to the wall. So I do not feel that this is exactly the time for any group to ask another group for succor.

Nevertheless, this may be an opportune time to plan for the future. We all know that adjustments have been made, and further adjustments must be made before we can work together to the point where we can rectify some of the mistakes and recover some of the losses we have met with in operating during the past several years. I feel that the problem of cooperation is complex, but I have in mind a plan that was announced by a vast majority of the sheet metal industry a few months ago, whereby a new set-up, which covered carload shipments of 50 bundles or over, and less than 50 bundles, was promulgated. When we got the new set-up we went over it carefully to find what our profits would be.

We were surprised to find that the profit allotted to the distributor on the set-up, on 50 and over and less than 50 bundles was 10 cents per 100, or $2.00 a ton, which figures approximately 3½%. We saw that the car price would be $2.85, and we were told that would be the price to anybody who purchased a car of sheets, regardless of the amount of tonnage they were able to consume during the year. Naturally this set-up did not appeal to the vast majority of us. We could not see how we could do business on a 3½% profit. But I feel there was considerable merit in that plan, nevertheless. I think the attempt to establish a differential for less than carload business is however, very good, as heretofore there has been no such effort. I feel however that a mistake has been made in not prescribing a minimum quantity which should apply.

I feel in questions of that kind, where there is required to be a radical change in the selling policy of the mills, that the distributors might be asked, through a select committee, to give the mills the benefit of their experience, and their views might be given. Then perhaps something might come of that plan. Whereas, so far, the result has been that the plan has been practically scrapped and discarded.

Another matter which I wish to speak about briefly is the growth in the sale of seconds. I think the mills realize, as we do, that unless this practice is controlled, the market for prime sheets will be curtailed. I understand that some mills are going to identify seconds. I think it would be a wonderful thing if some of the mills could exercise control of the distribution of seconds. We all know that there are certain channels where seconds could be shipped and do no harm, where they are just as good as primes. But if the mills, through some agency, could control the shipments of seconds, it would do a great deal to eliminate the dangers in that respect.

As a result of this suggestion the association appointed a committee to meet with the Flat Rolled Steel Manufacturers' Association.

A discussion of galvanized coatings brought out many points of vital interest to the entire sheet metal industry. The discussion by members follows:

George Fuchs

George Fuchs, Bruce & Fuchs Corp., New York: We do not handle seconds at all, discouraging the use of them as much as we can. The method is one that prevents the sale of seconds as primes, but the question is, must we educate the public or is the distributor to do it? At the present time a great many of the manufacturers are not branding the sheets at all, except with the ordinary little "S." But there are more seconds on the market today than there ever were. Only recently in Brooklyn a delivery was made of sheets on which I could not find any marks to indicate that those sheets were seconds. I believe we may thank the mills for any efforts that are being put forth to prevent seconds being sold as primes—yet what are we going to do when seconds come into the markets, as they do, at this time?

W. H. Bowe

W. H. Bowe, Herrick Co., Boston: We have dealers that handle seconds that are not marked as seconds, and they sell them as primes, as galvanized sheets, against the jobbers who handle nothing but primes. Only this last week I ran across a postal, being sent to dealers in New England, with a list of stock sizes, saying "A trial will convince you that our seconds are . . . etc." "The sheets are not marked to designate quality."

This looks as though the manufacturers are not all marking their seconds as seconds.

J. N. Remson

J. N. Remson, Eastern Rolling Mill Co., Baltimore: I don't know that anything can be done more than is now done, and so far as I know that is being generally done—that is, the marking of seconds plainly to prevent their being used as primes. I have no doubt there are some seconds in the market. Our practice is to designate them very clearly as seconds, and we propose to adhere to that practice.

F. O. Schoedinger

President Shoedinger: I have understood, gentlemen, that the manufacturers of sheets have discussed this same question in their meetings, and whether it would not be wise on their part to remelt the seconds—only this would make for a higher price on the prime sheets. This is a question I believe for this Association. It is a menacing question, this question of seconds, and always has been, and always will be unless some solution can be found. I wonder what you think of the idea of recommending to the manufacturers that they do this, and that our association may go on record as favoring a move of this kind.

F. M. Fuller

F. M. Fuller, American Sheet & Tin Plate Co.: The question of distributing seconds, principally galvanized seconds, is a serious one not only from the standpoint of the distributor or the jobber, but also the manufacturer, and it has been given very careful consideration by the mills. But the solution of this problem, like the problem of the general distribution of sheets, is going to depend very largely upon the co-operation between the jobber and the manufacturer. Our company has given very careful consideration to that subject. Our practice is to stencil any sheets that we know are for re-sale three times with the word "Seconds." The big problem is one of distribution of seconds in competition with primes. As I have said, it is a matter of co-operation and caution. Some jobbers have told us that they would not buy from us if our sheets were stenciled as seconds, because they could buy them elsewhere unstenciled. It is not only up to the manufacturer; it is a jobber's problem. I am inclined to think it is a little over-emphasized, as indicated by this card just read. Perhaps some of the manufacturers are indulging in this practice to get some business. That's what that card would indicate. That is a vicious practice and should be stamped out. It is up to the jobbers themselves. Just say you will not accept sheets unless plainly marked as seconds. As regards what percentage is represented by seconds, and is that percentage increasing or decreasing, I might say that perhaps on the average the percentage would be over 5%. If a manufacturer has over 5% on an average, it is poor practice. It must be borne in mind that it costs just as much to make seconds as it does to make primes. If you accumulate seconds you are losing money. I should say that the average would be from 5 to 7 per cent.

R. R. Lyon

R. R. Lyon, Lyon, Conklin & Co., Baltimore: As far as seconds are concerned, we don't handle any, never have. And we have run across very little of it in our territory. I don't believe there are many jobbers that do it.

Secretary Fernley then read the following resolution:

WHEREAS, Advices received indicate that during the past year many of the mills are branding all galvanized seconds as such with indelible ink and used their best efforts to prevent seconds being sold as primes by unscrupulous parties; therefore be it

RESOLVED, That we, the members of The National Association of Sheet Metal Distributors, hereby go on record as approving this action which will prevent the deception of the public.

The Resolution was seconded, approved and so ordered.

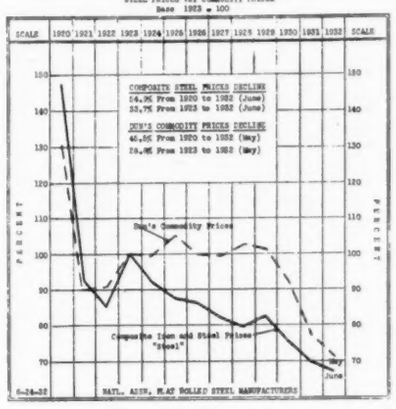
Steel Prices Foretold Depression

THAT steel prices were the barometer by which the 1929 depression might have been foretold, and may be the indicator which will first mark its end and the beginning of an upward trend, can be read in an analysis of steel prices and wages just issued by the Statistical Bureau of the National Association of Flat Rolled Steel Manufacturers.

The accompanying chart tells an interesting economic story. It clearly shows the evils of the over-expansion forced upon many industries during the war, and reveals how a close study of price trends in such basic industries as steel could have served as a warning since 1932 of the blow that was to fall six years later.

The price of all-commodities has declined 45.5 per cent in the last twelve years. In the same period the average price of steel slumped 54.9 per cent, or 9.4 points lower than the average.

In the 1920 slump, steel prices not only dropped with all other commodities, but continued the downward trend to a lower point.



Whereas, all-commodities started up in the middle of 1921, it was not until the middle of 1922 that steel started its rise.

Exactly one year later, in the middle of 1923, came the fork in the road where steel prices started a long downhill journey while commodity prices either maintained their level or increased. It is this turning point that some observers now feel might better have been given some prophetic recognition.

If we are to judge the percentage of reduction from the peak year of steel—1923, the last time when steel and all-commodity prices were on the same level, we find that the average price of steel has declined 33.7 per cent while the average price of all-commodities has declined 28.8 per cent.

Gravity exhaust VENTILATION

Residence Heat Removal

By Paul R. Jordan

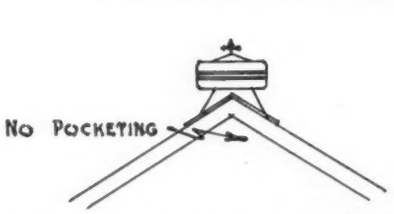
"I am interested in cooling the attics or homes to make them more comfortable in summer. I am told there are syphon ventilators which will exhaust the air from attics, but all the ventilators I have seen are a type that no one would want sticking up from the peak of their roof.

"Is it necessary that a ventilator be mounted on the peak of the roof? Would it work if it were a couple of feet below the ridge? If they could be put a few feet below the ridge of the roof, they could often be concealed from view from the front of the house."

VENTILATOR manufacturers are recognizing the demand for attic ventilation and are getting out ventilators to meet this demand. These are not of the type ordinarily described as siphon ventilators, but are of the various standard types, with certain features of design calculated to make them more attractive for residence use.

Perhaps appearance is the element of greatest importance with these residence ventilators. The value of attic ventilation has been recognized for a long time, but the objection of owners to the appearance has kept their use from becoming at all widespread, as no one wants a large barn or factory type ventilator sticking up from the peak of his roof.

It is quite feasible to install an attic ventilator on the side of the roof. The best results, however, will be obtained by putting the ventilator at the extreme high point of the roof. In case a side installation is used, the ventilator should be as high as possible.



Where possible, ventilators should straddle the ridge. The reason for this is to make sure that no pocket of dead, hot air remains in the attic. Any dead air remaining radiates heat throughout the attic

Many of the ventilators advocated for houses have a round band, and a straight square flaring base. They are distinctive and get away from the appearance of the barn or factory ventilators. These new units come already finished, usually in an enamel or aluminum paint. The idea of the color is to make the ventilator unobtrusive while at the same time giving an appearance of being a part of the building and not simply something set on it. The unit can be repainted to match the roof or the house trimming.

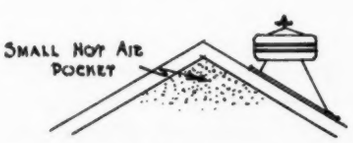
The outstanding characteristic of these units is that they set low. Experience with home owners brings out the fact that the thing that they object to most strenuously is height in a ventilator. The top of the ventilator will set well below the top of the smoke flue. This is accomplished by combining the base and ventilator in one unit.

While it will not be advisable to install the ventilator a few feet below the ridge of the roof, it can be installed on the back side of the roof at the top, in such a way that only the top of the band will be visible. This will answer the purpose as to appearance and will give reasonably good results from a cooling standpoint.

If you should install the ventilator a few feet below the comb of the roof, that area in the roof space **above** the ventilator opening will catch the hottest of the attic air and hold it there. The longer this air stays in the attic the hotter the air will get and will radiate its heat downward onto the ceiling below, defeating the purpose of roof space ventilation.

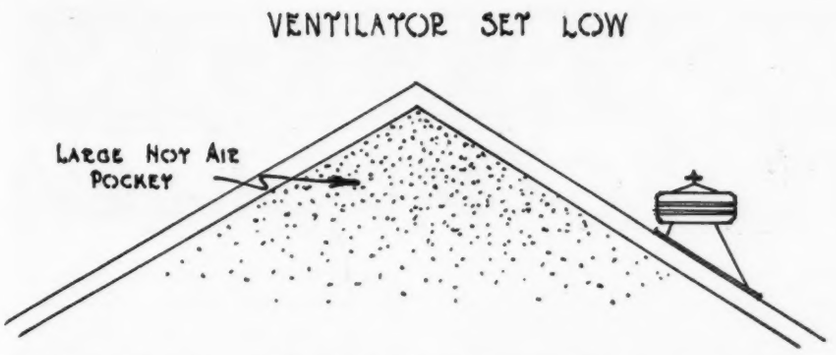
Naturally any ventilation you would get will do some good, but will not do anything like the good it will if the ventilator is properly installed. The sketches give you an idea of how this works out.

It would seem you are wise in looking to this phase of residence ventilation. There is a great deal of interest in residence ventilation at the present time and the results in added comfort obtainable by ventilating the attic and the rooms below are truly remarkable.



Oftentimes it is impossible to sell the owner on the idea of a ridge ventilator. In that case, set the ventilator behind the ridge but as high up as possible. Have the working area above the ridge if possible

One word about your selling talks; talk in terms of comfort and



This shows what happens when the ventilator is set too far down the back slope. All this dead air radiates heat to the other air in the attic and where the ventilator action is slow, because of little wind, actually heats the second floor ceiling by radiation

not in terms of degrees. The biggest effect of attic ventilation is that of **ceiling cooling**, and in the elimination of radiant heat. This does not show on the thermometer, but still it is an even larger element in hot weather discomfort than air temperature.

An illustration of this fact is that while air temperature in the sun is the same as that in the shade, a person is much more comfortable in the shade. Indoors as well as outdoors, nullification of the effects of radiant heat is important.

I believe that a little activity will show you good results in the sale of attic and sleeping room ventilation. There are certain contractors whom I know who are laying plans for modest direct mail advertising campaigns, calling the attention of their customers to the fact that they can furnish residence cooling systems at nominal cost through the use of attic and bedroom ventilation. I have no doubt but that they will bear results.

A Double Gas Furnace Installation

(*Continued from page 32*)

asbestos air cell wrapping. Then both casings and pipes were painted with a good grade of white water paint. The system is designed for an inside temperature of 70 degrees at 35 degrees outside.

The larger furnace heats the first floor and the smaller serves the second floor. Both furnaces have separate room thermostats to control the operation of the gas burners.

Cold air returns, which show but slightly in the basement picture, are painted with a dark gray enamel. The same color is used on the drop box into the fan and on the fan housing.

The registers throughout the house are all baseboard type. On the first floor an extension type wafer register was used in all rooms, while on the second floor a wafer type register, but not extension, was adopted. Most of the registers used on the second floor and both small rooms on the first floor use 8 by 10 registers. The others are 11 by 13, 10 by 12, and 9 by 12. All valves and insides of registers were painted with a dull black paint so no shiny metal shows through the face.

All return air grilles are located in the first floor, one being in the reception hall, another in the rear hall and the third in the maid's room. These grilles are all hardwood set in the floor and painted to match the flooring.

The system was sold by the Pacific Gas and Electric Company of San Francisco. The actual fabrication and installation was handled by the Paul Sheet Metal Works of San Francisco.

By the time the September issue reaches you, the winter season will be starting. Winter, in ventilation circles, is the season for heat, fume, smoke, and odor removal. This winter will also see widened interest in ventilation because industry will try to get along with old equipment. Contractors having questions on this type of work are invited to submit their problems.

ASSOCIATION Activities

Indianapolis Picnic

We don't believe that any better description of the Indianapolis picnic can be published than the plain, unvarnished report from our faithful reporter in the field. You can draw your own conclusions of the picnic from his report. The only thing we want to know is—How did Harry Jones and Homer Selch get in the picture twice without breaking a leg, or is this an optical illusion?

Our reporter says:

"I enclose photograph of the Indianapolis picnic. As you will see by this photograph, there was a very large turnout of handsome men and beautiful women, also some others.

"The day was given over to the usual sports, games and eating. The official baseball game in the morning between the Furmets and the Contractors was won by the Furmets by the slender margin of one or two runs after five innings of strenuous playing. The final score was said to be 14 to 16, although there was some uncertainty about the matter because the scorekeeper ran out of paper.

"The feature of the game was the umpiring of Harry Peterson. A noteworthy fact in this connection is that when the prizes were passed out to the winning team, Umpire Peterson received one of the prizes.

"Food was served and eaten at 12:30 and thereafter. The dinner was supplemented with free pop, ice cream, coffee and candy.

"The period immediately following the dinner was devoted to singing, led by George Joslin. The first song was sung to the tune of 'Sweet Adeline.' The other tunes I didn't recognize.

"Stake driving contests and balloon blowing contests for the ladies; unofficial horseshoe and baseball for the men, foot races, swimming, etc., for everybody completed the day. Visiting delegations from Louisville, Ky., Mishawaka and Lafayette were entertained."

◆

National Ass'n. of Sheet Metal Distributors Meeting

Tuesday afternoon, October 18, in the Marlborough-Blenheim Hotel in Atlantic City, has been set as the time for the next meeting of the National Association of Sheet Metal Distributors.

This announcement was made by Secretary George A. Fernley, who is also Secretary-Treasurer of the National Hardware Association, Philadelphia. The sheet metal distributors will meet, as is customary, concurrently with the annual convention of the Hardware Association, which is October 17th and 18th.

◆

Milwaukee Ass'n August Picnic

At the June meeting of the Milwaukee Sheet Metal Contractors Assn. the Picnic Committee submitted a report on a picnic which can be held anytime during the month of August.

The committee said it had gone into this matter very thoroughly to get reasonable rates on everything in connection with such an affair, and thus making it as inexpensive as possible for each member, taking into consideration, however, that the same should compare favorably with past events.

The committee has decided on the old playground, "Wolff's Island, on the Milwaukee River," and those that attended past meetings felt that that was the ideal spot as proved by experience during the past years at that resort.

The Picnic Committee guarantees that the affair can be run successfully for the sum of from $3.00 to $3.50 per person, which includes everything, from morning to night, such as morning cold lunch, warm noon-day dinner, afternoon bratwurst feast, with all the necessary prohibition whistle moisteners, etc., etc.

◆

Milwaukee Local Meeting

June 1st was a busy day for the officers and members of the Sheet Metal Contractors Association of Milwaukee.

In the afternoon they entertained the officers of the State Association, who held a meeting in that city.

In the evening they held their regular meeting after which they had open house for the local wholesalers and manufacturers' representatives.

The state officers who attended the meeting were:

State Pres.—R. G. Suettinger of Two Rivers.

Vice-Pres.—Geo. Bishoff of Marinette.

Vice-Pres.—J. Birthrong of Waukesha.

Treasurer—A. C. Goethel of Milwaukee.

Secy.—Paul L. Biersach of Milwaukee.

After the regular meeting of the local association, Arnold Holming, President, introduced two representatives of the American Brass Co. who showed some very interesting moving pictures of sheet copper in the making.

About seventy-five representatives of the sheet metal industry were on hand for the social hour and all indulged freely in the buffet lunch.

Henry, Pluckhan, chairman of the entertainment committee, was the official greeter, and announced that the annual picnic will be held this year at Wolff's Island in August.

New PRODUCTS

A Washed Air Conditioner

A new unit air conditioner, containing a filter section, twin blowers, motor, washer and eliminators all cased in one compact unit is announced by the Meyer Furnace Company, Peoria, Ill.

Installation of the unit is declared very simple—only one boot connection being necessary as return air connections may be omitted. However, the company recommends a complete return system rather than the use of the basement for a plenum.

Equipment is arranged with filters first, blowers second, washer next and eliminator plates last. All connections, water, electrical and drain are outside the unit for protection. The overall dimensions are 45 by 29 by 42 inches high. Standard finish is gray.

The filter is the viscous type, of special oil-treated jute in roll form, a fresh cleaning surface of which may be introduced by a few turns of a crank once or twice a month. When used up a new roll is simply installed. A top for return air duct connections or open top is optional.

Twin blowers are of double inlet, double width (4 inlets) low-speed centrifugal type, designed especially for domestic heating and ventilating where quietness is essential.

The washer is equipped with four nozzles, (each having an individual strainer) of latest design, producing a finely divided spray to secure the greatest degree of atomization for thorough washing. Standard equipment is for 15 gallons per hour delivery, but may be had for 24 or 40 gallons per hour if desired. The

washer chamber is heavily lead coated to resist corrosion. The eliminator plates are of the most efficient design, and their great number together with close spacing insures the removal of all water particles from the air so that even at highest water delivery the only moisture coming through is in the form of vapor.

Equipment includes combination fan and limit control operating from furnace bonnet, solenoid water valve, hand valve, main strainer, all electric furnace regulator (room thermostat, damper motor and accessories).

◆

Coal or Oil Air Conditioner

A new air conditioning unit, in sizes for the small house, and designed for burning either coal or oil is announced by the Fox Furnace Company, Elyria, Ohio. In addition, the company announces reduced prices on these units.

Capacities range from 100,000 to 289,000 B.t.u. per hour, or small enough for an average six room house. The unit is furnished in standard Fox maroon and black square casings, with a separate blower and filter cabinet.

Equipment included in the unit—heavy boiler plate steel furnace with crescent radiator, centrifugal blower on special base, oil pregnated filters, blower switch, automatic drip humidifier or spray type humidifier for larger sizes, a limit control, thermostats suitable for either coal or oil.

Details of the new unit are contained in a catalogue which will be mailed upon request to the company.

Gar-Wood Furnace

A new oil-fired furnace unit for warm air heating and air conditioning has been announced by the Wood Hydraulic Hoist & Body Company, Detroit, manufacturers of the Gar-Wood Boiler.

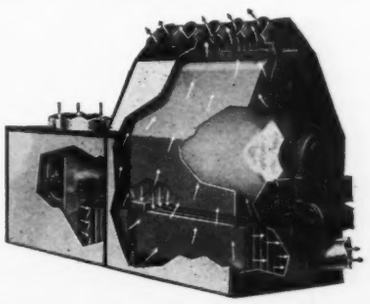
The new Gar-Wood is said to be adaptable to every type and size residence and to apartment and commercial buildings within the range of air conditioning.

It is a combined unit, that is, the burner fires into a combustion chamber designed as an integral part of the furnace. Unusually high efficiency and low operating cost is claimed for the new equipment.

A notable feature of the design is the use of flat, narrow flues as an "economizer" designed to transfer heat as it passes from the combustion chamber.

Small and compact in appearance, the furnace has more than three times the usual heating surface; an exceptionally high ratio of flue area to firebox heating surface; counter flow heat transfer; and down draft gas flow. It is built of selected materials throughout.

The complete installation includes nozzle type air washers, eliminators, centrifugal blower and automatic humidifier giving air washing, ventilation, humidification and some degree of summer cooling depending upon the



temperature of the water used in the nozzle. Installation of the furnace without these fixtures can be made when desired.

New sales literature describing the Gar-Wood Air Conditioning Unit is available.

New Oil Burning Furnace

A new oil burning furnace of the vaporizing bowl type and designed for either gravity or forced air installations is announced by the Perfection Stove Company, Inc., 7609 Platt Ave., Cleveland, Ohio. The new unit, known as the Superfex, uses either number 1 oil or kerosene and has no moving parts for combustion.

Three sizes—53,000, 65,000, and 130,000 B.t.u. output—and a pipeless unit are being manufactured.

The small unit comes in a round casing, while the other three are square cased with standard colorings —maroon enamel with black japanned trim.

The heater has a steel combustion chamber and a circular, top type steel

radiator with an automatic draft control chamber at the smoke pipe throat. The casing is double wall. An automatic humidifier operating by either manual or thermostatic control is standard equipment.

Arrangements have been made with the Warm Air Furnace Fan Company to supply a forced air unit with a propellor fan and louvres housed with two sections of dry filter and a bonnet control.

Literature describing the new unit has been prepared and can be secured from the company.

◆

Lau Air Conditioning System

A new air conditioning unit—Lau air conditioning system — manufactured by the Lau Heating Service, Inc., Dayton, Ohio, has been put on the market.

The unit consists of a blower, filter, and washer made in separate units which can be assembled according to the needs of the installations. The filters are of the dry type with two sections for the blower unit. The filters are placed adjacent above the wheel. The washer consists of sprays connected to the city water line with a pressure reducing valve for pressure control. Spray heads are self cleaning and arranged to insure a mist throughout the cabinet and constant film of water over the eliminator plates at the washer mouth.

The blower is of the two wheel type with low tip speeds and the motor mounted outside the housing. Motor is split phase type mounted on a spring base. The units are furnished in crackle green with black trim.

The small Number 1 unit, is designed for use on gravity installations, and other places where the duct static is not very high.

The Number 2 unit, and Number 3 unit, are for use on larger forced air jobs where greater static is encountered, and a greater quantity of air is required.

The Number 4 unit at present consists only of blower and filters.

◆

New Two-Ply Stainless Steel

The heating, ventilating and air conditioning industries will be interested in the announcement that the Ingersoll Steel and Disc Co., Chicago, (a division of the Borg-Warner Corporation) has perfected a commercially successful two-ply stainless steel. This new metal, to be known as Ingoclad Stainless Steel, is produced by patented process from the composite ingot.

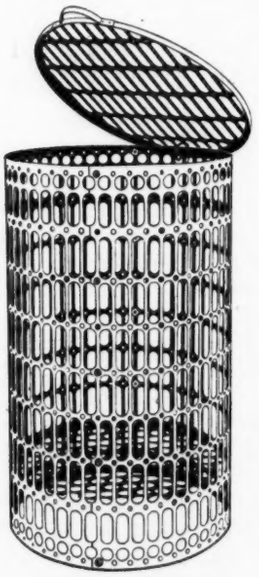
It is stated that the manufacturing process has been developed to the point where a perfect bond between the stainless steel and the carbon steel back are assured. Ingoclad will be marketed at a price which will permit its use for countless applications, such as heating and ventilating ducts, fan, unit heater and air washing and humidifying apparatus.

This new stainless steel may be deep drawn, stamped, welded, formed, polished and is now being produced in various gauges and sizes. Facilities will be available in the near future to supply all practical commercial sizes.

Outdoor Incinerator of Heavy Steel

The King outdoor incinerator is an article which is ornamental in appearance, yet substantial in construction. It should be especially welcome in homes equipped with oil burners and stokers where the disposed of leaves, paper and trash in furnaces or boilers is a summer problem.

For golf clubs, parks, playgrounds and cemeteries it fills the need for a



waste paper container which will stand abuse without collapsing or blowing away.

The incinerator is made of No. 14 steel with a No. 12 gauge removable grate.

Full information may be secured from the manufacturers, The Harrington & King Perforating Company, 5655 Fillmore St., Chicago.

◆

New Smoke Pipe Connector

The Hess Warming & Ventilating Company, 1201 S. Western Avenue, Chicago, has just placed on the market a new smoke pipe connector for use between the smoke pipe and chimney. This is designed to replace the ordinary thimble connection. It is made of heavy steel plate and is said to be permanent and unbreakable. No cemented joint is used. A steel plate covers the square connection, bolting to the surface of the inner brick square opening. It is easily installed in new or old chimneys and makes a tight joint. The square shape, with its oversize capacity to receive the round smoke pipe, helps greatly to prevent soot accumulation. Being made of steel, it will last many years.

News Items . . . . . .

Graff Furnace Changes Ownership

The furnace and range patterns and all equipment of the Graff Furnace Company, Scranton, Pennsylvania, were purchased from the receiver July 27 by a syndicate composed of W. E. Nesbit of Omaha, Nebraska, Charles P. Forshew of Scranton, Penna., and A. G. Vickers of New York City.

The new company states that manufacture of furnaces will be continued from the old plant under the name of Faultless Heater Corporation. Ranges will be manufactured under the name Faultless Range and Manufacturing Company.

Each company has enlisted new capital and will give dealers improved products and service.

The new address will be Scranton, Penna.

◆

David Levow Leaves Interlock

Announcement is made that David Levow has sold his interest in and is no longer connected with the Interlock Flashing Corp., New York City.

◆

Advertiser Devotes Space to Employment Drive

"Help Unemployment by Purchasing U. S. Products Made by U. S. Labor." Readers of many national magazines and trade publications will, beginning this month, find the above sentence prominently displayed in advertisements signed by the Kester Solder Company. The appearance of this message signalizes the beginning of a constructive movement inaugurated by the Kester Solder Company, manufacturers of flux-core solder.

"The idea of urging the purchase of U. S.-made products is not, in itself, new," said F. C. Engelhart, President of the Kester Solder Company, in explaining the plan. "But almost always, in the past, these efforts have been in connection with a particular product only, and, therefore, have lost much of their sincerity and effectiveness because the public sensed that the advertiser was merely taking a new means of endeavoring to sell his own product.

"In our own case, we have virtually no foreign competition since practically all the flux-core solder used in this country is made in America. Our idea is simply to help unemployment generally throughout the United States by urging the purchase of products of any and every kind that are made in the United States by American labor. We believe that if a large number of American manufacturers and retailers adopt and use this slogan in their advertising, it will have an important effect on the unemployment situation."

◆

Manufacturer Increases Schedule

Announcement from Syracuse, N. Y., states that the Lennox Furnace Company of that city has resumed operations on a full five-day-a-week schedule.

◆

New Hess Distributer

Alvin Lohbauer, 15 South Spring Street, Elgin, Ill., has been appointed distributer for Elgin and vicinity for the Hess line of air conditioning equipment and furnaces.

A special display has already been arranged by Mr. Lohbauer.

News Items . . . . . .

Revere Opens San Francisco Office

Revere Copper and Brass Incorporated has opened a sales office in San Francisco at 1615 Rust Building. R. H. Binns, Jr., Pacific Coast Manager in charge of this office, was formerly assistant sales manager of the Rome Division of Revere, and before that engaged in the metal distributing business.

The opening of this office will give Revere customers on the Pacific Coast and in other far-western states closer direct contact with the company.

◆

Air Conditioning at Exposition

Since air conditioning is one of the most interesting subjects to the public at the present time, it is natural that plans for participation in Chicago's 1933 World's Fair—A Century of Progress Exposition—are being made by leading producers in the industry.

The site selected for exhibits of air conditioning products is unusually opportune. It is in the Home and Industrial Arts Exhibit, where everything that enters into the construction, equipment, furnishing and decorating the home will be demonstrated.

Eight residences demonstrating new uses of building materials, presenting fresh solutions for housing problems, all designed and decorated in a new and modern fashion, will be built on the Fair grounds. They will be built with the average person's pocketbook in mind, yet they will be attractive and livable.

In all these homes some phase of air conditioning or humidification will be demonstrated. Some will be cooled, so that on a sweltering summer day the visitor, tired and warm with sight-seeing, may refresh himself and learn how he may similarly equip his own home.

◆

G. A. Voorhees Joins Furblo

G. A. Voorhees, heating engineer of Indianapolis, Indiana, has joined the Furblo organization and will represent the company in Indiana. His duties will be those of sales engineer and state representative.

Guy Voorhees needs no introduction to American Artisan readers. For several years he has been prominent in heating work in the middle west and through his work and his articles has established a most excellent reputation.

Ira W. Rowell, General Manager of the Lakeside Company, says that this appointment gives the Lakeside Company twenty-seven direct factory representatives in the warm air heating states. Every one of these men is either a graduate or a practical engineer.

◆

New Shop Opened

D. Schmerer, Inc., Richmond Hill, Long Island, New York, has been organized to take over and expand the business of David Schmerer, 12030 Jamaica Ave. The new organization will manufacture roofing and other metal products as well as do a general sheet metal contracting business.

◆

Stoker Manufacturer Moves

The Motorstoker Corporation announces that after July 4th its main offices will be located at 290 Hudson Street, New York City, where the company's combined facilities will occupy the whole of a five-story building.

News Items . . . . . .

Gas Burner Rental in Kansas

Side-stepping the Kansas law which prohibits appliance merchandising by utilities, the Kansas Pipe Line & Gas Co., and the Kansas Power & Light Co., have obtained approval from the Kansas Public Service Commission for a house heating rate which provides for the gas companies to rent burners to consumers in about 40 towns. Equal to $1.70 a month, the rental charge is included in the rates from October to May, inclusive, when the customers pay $1 for the first 1,000 cubic feet of gas; 50 cents for each of the next 2,000; 60 cents each for the next 17,000; 50 cents for each of the next 80,000, and 30 cents each for all over 100,000 cu. ft. During the four summer months, the rate is $1 for the first 1,000 cu. ft., and 50 cents for each of the next 19,000 cu. ft.

The new rate does not apply to 16 cities and towns which have franchise provisions prohibiting this type of rate.

◆

Anthracite Laboratory Approves Cleaner

Bulletin No. 12 of the Anthracite Institute Laboratory conveys official approval of the Kent Vacuum Furnace Cleaner by the Anthracite Laboratory for the cleaning of boilers and furnaces burning Pennsylvania anthracite. "Practical laboratory tests," the report says, "show this machine to be sturdily built yet light and easy for one man to handle. It is powerful and has adequate dirt capacity for the purpose for which it was intended."

◆

Foy Now Republic's Chicago Manager

Norman W. Foy has been appointed Chicago District Sales Manager of Republic Steel Corporation, according to an announcement made this week by N. J. Clarke, Vice-President in Charge of Sales.

Mr. Foy became associated with the old Republic Iron and Steel Company as a salesman in 1919. He was subsequently manager of the company's Buffalo, Boston and Birmingham offices, being made Ass't Western Manager of Sales shortly after the formation of the present Republic Corporation.

Mr. Foy will continue to make his headquarters at Republic's district sales offices in the McCormick Building, Chicago.

◆

Death of Gilbert Follansbee

Gilbert Follansbee, general manager of the Toronto, Ohio, plant of the Follansbee Brothers Company, Pittsburgh, died at his home in Steubenville, Ohio, on July 13, following an operation. He was born at Pittsburgh 45 years ago, and was the son of William U. Follansbee, chairman of the board of the Follansbee company. He had been identified with the company during his entire business career.

◆

Appoint Peerless Distributor

Moise Steel Company, Linwood Avenue and the Pennsylvania Railroad tracks, Cincinnati, Ohio, have beeen appointed distributor for the Peerless line of furnaces, fittings and registers.

The new distributor will cover southern Ohio and Kentucky.

News Items . . . . . .

Osborn Goes on the Air

The J. M. & L. A. Osborn Co., of Cleveland, will be on the air August 1, 8, 15, and 22 in the Cleveland Prosperity Program. The time is 7:00 to 7:30 each of these evenings, eastern time. The station used is WJAY.

◆

Interlock Flashing Moves Office

Interlock Flashing Corporation has moved its main offices to Room 826, 101 Park Avenue, New York City. All mail should be sent to the new address.

◆

Appoints Dygert Agent

Lee Dygert, 42 North Division Avenue, Grand Rapids, Michigan, has been appointed McIlvaine dealer for that territory. Mr. Dygert is well known in the industry, having formerly handled Silent Automatic for several years in the Grand Rapids district.

◆

Air Conditioning Market Visualized

Forecasting a 40 per cent gain for 1932 in the amount of copper used by the new-born air conditioning industry, a consumption of 3,500,000 pounds of the red metal for the current year has just been estimated by the Copper and Brass Research Association. Should summer cooling and winter humidification of residential quarters reach the degree of public acceptance freely predicted to occur within the next five to ten years by leading industrialists and conditioning experts, the Association looks to an annual market conservatively estimated at from 35,000,000 to 45,000,000 pounds of copper.

The basis for such increase, the Association's survey states, is (1) the 100 per cent increase during 1931 in the number of companies manufacturing complete units or parts for air conditioning equipment, (2) a sharp rise in the sale of small cooling and humidifying units, although installation of large central station systems may show little increase over the previous year, and (3) the discovery that ordinary automobile-type copper radiators, less expensive than other cooling or heating surfaces, can be effectively applied in systems using blocks of ice instead of refrigeration compressors for the source of cooling.

Discussing the various markets, the Association's report points out that "the air conditioning industry can be expected to move forward with unusual rapidity, from an analysis of the many commercial interests lending their weight to the development. An important factor is that there is no substitution or replacement involved; winter humidifying and summer cooling are entirely new. The new industry will not be handicapped by the struggle of any predecessor to maintain some previously established advantage.

"Although there will continue to be comparatively few cases of complete residence year-round air conditioning, thousands of conditioning units performing various functions will be sold during 1932. The potential expansion in the residence market is greater than all other fields combined. While many systems will be installed to humidify the entire home in winter, summer cooling will largely be confined for the present to one or two rooms, thus allowing this new-found comfort to be within the range of the average home-owner's pocketbook."

New Literature . . . .

Revere Issues New Catalog

Following its custom of issuing catalogs semi-annually, Revere Copper and Brass Incorporated has mailed to the trade its July 1st issue.

As usual, the catalog is a completely bound book, with the whole story regarding any one form of product being placed on two facing pages. Buyers will find this very convenient for quick comparison.

The page size has been increased from 7¼" x 9" to 8½" x 11", which permits of easier reading and filing.

◆

Graded Oil Burner Markets

Placing a graded market value on every single county in the United States, the American Oil Burner Association has just completed, for its membership, an exhaustive analysis showing the potential markets for domestic oil burners by counties, states and groups of states.

The survey, entitled, "Graded Oil Burner Markets," provides state and county index bases on which localized market maps may be prepared with a high degree of accuracy.

The base index, founded on concentration of market, standard of living and possession of wealth, takes into consideration the following elements: number of dwellings, number of native white families, number of telephone families, number of residential, urban and rural electric service users, number of income tax returns filed and spendable money index. The ratio between county and national indices in the foregoing respects gives the "Base Index."

With a general base index thus fixed, the basic findings are then corrected for the factors peculiar to, or related to, the sale of oil burning equipment. These are: climate and the competitive fuels of coal and manufactured and natural gas. Determination of markets is broken up into three classifications as follows: values per 1,000 sq. miles by groups of states, values per 1,000 sq. miles by individual states and finally market values by counties.

Copies are limited but if readers want information on their territory we will be glad to send you the survey's report for that territory.

◆

New House Organ Appears

A small, but ambitious, house organ reflecting the personality of the company is being mailed by the McIlvaine Burner Corporation, Evanston, Ill. The first issue has just been mailed. We don't know whether or not any dealer can get on the mailing list, but if you are interested in oil burners, you might try.

Incidentally the McIlvaine company just recently published the fact that the first six months of 1932 are 14 per cent ahead of the first six months of 1931.

◆

Three Motor Wheel Leaflets

Motor Wheel Corporation, Heater Division, has printed three new leaflets suitable for prospects. The first of these describes the M. W. oil burning water heater, the second the oil burning cooking range and the third the oil burning boiler. Copies of these leaflets may be secured from the company. The address is Lansing, Michigan.

New Literature . . . .

Manual for Motor Wheel Units

A new manual of ratings, specifications and data for Motor Wheel Corporation Weather Control units has been prepared.

The manual covers the design and operation of these units from all technical angles giving complete specifications, operating characteristics, blower data, and a code of installation for forced air systems.

The booklet shows and describes the weather control units, shows all tables of performance data, and contains necessary charts, tables and rules for installation.

A copy can be secured by addressing the Heater Division, Lansing, Michigan.

◆

Furnace Chain Catalogue

A catalogue showing the complete line of sash, plumber, ladder and jack chain, several items suitable for use on furnaces has been compiled by the John M. Russell Manufacturing Company, Inc., Naugatuck, Conn., and will be mailed to readers addressing the company.

◆

What and Why Leaflet

A leaflet, "What—Why, With Silentair," published by the A. Gehri Company, Tacoma, Washington, shows by pictures why forced air under automatic control will rectify the usual heating troubles. These drawings show why forced air saves fuel and basement room, makes floor, chair and head heights uniform in temperature, removes smoke, provides freshened air and eliminates dust and dirt. Any prospect can understand these benefits by looking through this leaflet.

The company has also revised its fan and washer leaflets and has placed in one binder all literature relating to its products. Copies of this literature can be secured by writing the company.

◆

Journal and Stock List

A new issue of the Ryerson Journal and Stock List has just been published. This very handy reference book on steel, in addition to complete general descriptions, specifications, sizes, etc., contains the new extras on bands, the new cold finished steel extras, the new hot rolled cutting extras, and other information of value to the steel user.

Joseph T. Ryerson & Son, Inc. of Chicago, Jersey City and Boston with plants in all the principal cities will furnish copies on request.

◆

Plate Metal in Mechanical Equipment

A colorful leaflet describing the use of plate metal in boiler rooms, for hoppers and stoker equipment, in bins, tanks, breechings, and for other similar equipment has been prepared by American Rolling Mill Company, Middletown, Ohio. Contractors using this form of metal in their work may secure a copy of this booklet by sending their request to the company.

BUYERS' GUIDE

AIR CLEANERS
American Air Filter Co., Inc., Louisville, Ky.
Kleenaire Filter Co., Stevens Point, Wis.
Lakeside Co., Hermansville, Mich.
Owens-Illinois Glass Co., Toledo, Ohio

AIR CONDITIONERS
(See Unit Air Conditioners)

AIR WASHERS
Gehri & Co., Inc., A., Tacoma, Wash.
Health Air Systems, Ann Arbor, Mich.
Hess Warming & Vent. Co., Chicago, Ill.
Lakeside Co., Hermansville, Mich.
Meyer Furnace Co., The, Peoria, Illinois.

BLAST GATES
Berger Bros. Co., Philadelphia, Pa.

BLOWERS
Gehri & Co., Inc., A., Tacoma, Wash.
Health-Air Systems, Ann Arbor, Mich.
Hess Warming & Vent. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lakeside Co., Hermansville, Mich.
Meyer Furnace Co., The, Peoria, Illinois.

BRAKES—BENDING
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.

BRAKES—CORNICE
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.

BRASS AND COPPER
American Brass Co., Waterbury, Conn.
Revere Copper and Brass, Inc., Rome, N. Y.

CASING RINGS—FURNACE
Forest City Foundries Co., Cleveland, Ohio.
Peerless Foundry Co., Inc., Indianapolis, Ind.

CASTINGS—MALLEABLE
Berger Bros. Co., Philadelphia, Pa.
Fanner Mfg. Company, Cleveland, Ohio

CEILINGS—METAL
Globe Iron Roofing and Corrugating Company, Cincinnati, Ohio
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

CEMENT—FURNACE
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Northwestern Stove Repair Co., Chicago.

CHAIN—FURNACE
Hart & Cooley Mfg. Co., Chicago, Ill.
Russell Mfg. Co., Inc., The John M., Naugatuck, Conn.

CHAPLETS
Fanner Mfg. Company, Cleveland, Ohio

CLEANERS—FURNACE VACUUM
Breuer Elec. Mfg. Co., Chicago, Ill.
National Super Service Co., Toledo, Ohio
Northwestern Stove Repair Co., Chicago.
Ramey Mfg. Co., The, Columbus, Ohio.

CONDUCTOR ELBOWS AND SHOES
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City

CONDUCTOR FITTINGS
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

CONDUCTOR PIPE
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

CONTROLS, FURNACE
Automatic Humidifier Sales Co., Detroit, Mich.

COPPER
American Brass Co., Waterbury, Conn.
Brown Wales Co., Boston, Mass.
Revere Copper & Brass, Inc., Rome, N. Y.

CORNICES
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City

CRIMPING MACHINES
Bertsch & Company, Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

CUT-OFFS—RAIN WATER
Barnes Metal Products Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City

DAMPERS—QUADRANTS—ACCESSORIES
Aeolus Dickinson, Chicago, Ill.
Hart & Cooley Mfg. Co., Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City
Parker-Kalon Corp., New York, N. Y.
Young Ventilating Co., Cleveland, Ohio

DIFFUSERS—AIR DUCT
Aeolus Dickinson, Chicago, Ill.

DRIVE SCREWS—HARDENED METALLIC
Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York

EAVES TROUGH
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Globe Iron Roofing & Corrugating Co. Cincinnati, Ohio
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City

EAVES TROUGH HANGERS
Barnes Metal Products Co., Chicago, Ill
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City

FANS—FURNACE
A-C Mfg. Company, Pontiac, Illinois
Gehri & Co., Inc., A., Tacoma, Wash.

FILTERS—AIR
American Air Filter Co., Inc., Louisville, Ky.
Kleenaire Filter Co., Stevens Point, Wis.
Lakeside Co., Hermansville, Mich.
Owens-Illinois Glass Co., Toledo, Ohio

FILTERS—FURNACE
American Air Filter Co., Inc., Louisville, Ky.
Gehri & Co., Inc., A., Tacoma, Wash.
Kleenaire Filter Co., Stevens Point, Wis.
Lakeside Co., Hermansville, Mich.
Owens-Illinois Glass Co., Toledo, Ohio

FITTINGS, PIPE, GAS STOVE
Fanner Mfg. Co., Cleveland, Ohio.

BUYERS' GUIDE

FLUXES—SOLDERING

Kester Solder Company, Chicago, Ill.

FORMING ROLLS

Bertsch & Company, Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

FURNACE CLEANERS

(See Cleaners—Furnace Vacuum)

FURNACES FOR GAS OR OIL

Health-Air Systems, Ann Arbor, Mich.
Henry Furnace & Foundry Co., Cleveland, Ohio.

FURNACES—GAS

Forest City Foundries Co., Cleveland, Ohio
Henry Furnace & Foundry Co., Cleveland, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Meyer Furnace Company, Peoria, Ill.
Payne Furnace and Supply Co., Beverly Hills, Calif.

FURNACES—GAS AUXILIARY

Forest City Foundries Co., Cleveland, Ohio

FURNACES, GAS SOLDERING

Interstate Machinery Co., Chicago.

FURNACES—OIL BURNING

Meyer Furnace Co., The, Peoria, Illinois.
Motor Wheel Corp., Heater Div., Lansing, Mich.
Peerless Foundry Co., Indianapolis, Ind.

FURNACES—WARM AIR

(See Also Unit Air Conditioners)

Agricola Furnace Co., Gadsden, Ala.
Andes Range & Furnace Corp., Geneva, N. Y.
Deshler Foundry & Machine Works, Deshler, Ohio
Forest City Foundries Co., Cleveland, Ohio
Health-Air Systems, Ann Arbor, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Vent. Co., Chicago, Ill.
Lennox Furnace Co., Marshalltown, Iowa
May-Fiebeger Co., The, Newark, Ohio.
Meyer Furnace Co., The, Peoria, Illinois
Motor Wheel Corp., Heater Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Peerless Foundry Co., Indianapolis, Ind.

GRILLES

Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Chicago, Ill.
Independent Register & Mfg. Co., Cleveland, Ohio.
Meyer & Bro. Co., F., Peoria, Ill.
Rock Island Register Co., Rock Island, Ill.

GUARDS—MACHINE AND BELT

Harrington & King Perforating Co., Chicago, Ill.

HANDLES—BOILER

Berger Bros. Co., Philadelphia, Pa.

HANDLES—FURNACE DOOR

Fanner Mfg. Co., Cleveland, Ohio.

HANDLES—SOLDERING IRON

Parker-Kalon Corp., New York, N. Y.

HEATERS—CABINET

Agricola Furnace Co., Gadsden, Ala.
Motor Wheel Corp., Heater Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.

HEATERS—GAS CABINET

Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.

HEATERS—SCHOOL ROOM

May-Fiebeger Co., The, Newark, Ohio.
Meyer Furnace Company, The, Peoria, Ill.
Peerless Foundry Co., Indianapolis, Ind.

HUMIDIFIERS

Automatic Humidifier Sales Co., Detroit, Mich.
Clarm Mechanical Devices Co., Lima, Ohio
Columbus Humidifier Co., Columbus, Ohio.
Hess Warming & Vent. Co., Chicago, Ill.
Lakeside Co., Hermansville, Mich.
Meyer & Bro. Company, F., Peoria, Ill.
Salisda Mfg. Co., Minneapolis, Minn.

MACHINERY—CULVERT

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

MACHINERY—REBUILT AND USED

Interstate Machinery Co., Chicago, Ill.

MACHINES AND TOOLS—SHEET METAL WORKING

Bertsch & Company, Cambridge City, Ind.
Brown Wales Co., Boston, Mass.
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa.
Parker-Kalon Corp., New York, N. Y.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

METAL LATH—EXPANDED

Barnes Metal Products Co., Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

MITERS

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

NAILS—HARDENED MASONRY

Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York, N. Y.

PERFORATED METALS

Harrington & King Perforating Co., Chicago, Ill.

PIPE AND FITTINGS—FURNACE

Henry Furnace & Fdy. Co., Cleveland, Ohio.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Peerless Foundry Co., Indianapolis, Ind.

POKERS—FURNACE

Fanner Mfg. Co., Cleveland, Ohio.
Henry Furnace & Foundry Co., Cleveland, Ohio.
Independent Reg. & Mfg. Co., Cleveland, Ohio.

BUYERS' GUIDE

PRESSES

Dries & Krump Mfg. Co., Chicago, Ill.

PULLEYS—FURNACE

Hart & Cooley Mfg. Co., Chicago, Ill.

PUNCHES

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

PUNCHES—COMBINATION BENCH AND HAND

Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York, N. Y.

PUNCHES—HAND

Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

RADIATOR CABINETS

Hart & Cooley Mfg. Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Revere Copper & Brass, Inc., New York City.

REGISTERS

Forest City Foundries Co., Cleveland, Ohio.
Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio.
Independent Register & Mfg. Co., Cleveland, Ohio.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Peerless Foundry Co., Indianapolis, Ind.

REGISTERS—WOOD

Auer Register Co., Cleveland, Ohio.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

REGULATORS AND LOCKS, VOLUME DAMPER

Young Ventilating Co., The, Cleveland, O.

REGULATORS—AUTOMATIC HEAT

Cook Electric Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

REPAIRS—STOVE AND FURNACE

Brauer Supply Co., A. G., St. Louis, Mo.
Des Moines Stove Repair Co., Des Moines, Iowa.
National Foundry & Furnace Co., Dayton, Ohio.
Northwestern Stove Repair Co., Chicago, Ill.
Peerless Foundry Co., Indianapolis, Ind.

RIDGING

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

RINGS—FURNACE CASING

Forest City Foundries Co., Cleveland, Ohio.

ROOF FLASHING

Barnes Metal Products Co., Chicago, Ill.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

ROOFING—IRON AND STEEL

American Rolling Mill Co., Middletown, Ohio.
Barnes Metal Products Co., Chicago, Ill.
Brown Wales Co., Boston, Mass.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.
Inland Steel Company, Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., The, Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

ROOFING—TIN AND TERNE

Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

RUBBISH BURNERS

Hart & Cooley Mfg. Co., Chicago, Ill.

SCREWS—HARDENED METALLIC DRIVE

Interstate Machinery Co., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Parker-Kalon Corp., New York City.

SCREWS—HARDENED SELF TAPPING SHEET METAL

Interstate Machinery Co., Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Parker-Kalon Corp., New York City.

SCREENS—PERFORATED METAL

Harrington & King Perforating Co., Chicago, Ill.

SCUPPERS

Aeolus Dickinson, Chicago, Ill.

SHEARS—HAND AND POWER

Dries & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa.
Viking Shear Company, Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill

SHEET METAL SCREWS—HARDENED, SELF-TAPPING

Interstate Machinery Co., Chicago, Ill.
Parker-Kalon Corp., New York City.

SHEETS—ALLOY

Inland Steel Company, Chicago, Ill.
International Nickel Co., New York, N. Y.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

SHEETS—BLACK, CORRUGATED, GALVANIZED

American Rolling Mill Co., Middletown, Ohio.
Brown Wales Co., Boston, Mass.
Granite City Steel Co., Granite City, Ill.
Inland Steel Company, Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

SHEETS—COPPER

American Brass Co., Waterbury, Conn.
Brown Wales Co., Boston, Mass.
Revere Copper & Brass, Inc., Rome, N. Y.

SHEETS—COPPER BEARING STEEL

American Rolling Mill Co., Middletown, O.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago, Ill.

BUYERS' GUIDE

Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

SHEETS—COPPER (LEAD COATED)

American Brass Co., Waterbury, Conn.
Revere Copper & Brass, Inc., Rome, N. Y.

SHEETS—IRON

American Rolling Mill Co., Middletown, O.
Brown Wales Co., Boston, Mass.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

SHEETS—MONEL METAL

International Nickel Co., New York.

SHEETS—NICKEL

International Nickel Co., New York.

SHEETS—PURE IRON COPPER ALLOY

Inland Steel Co., Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.

SHEETS—REFINED OPEN HEARTH IRON

American Rolling Mill Co., Middletown, O.
Republic Steel Corp., Youngstown, Ohio.

SHEETS—SPECIAL FINISH

American Rolling Mill Co., Middletown, O.
Inland Steel Company, Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio.

SHEETS, STAINLESS STEEL

Brown Wales Co., Boston, Mass.
Republic Steel Corp., Youngstown, Ohio.

SHINGLES AND TILE—METAL

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

SKYLIGHTS

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

SNOW GUARDS

Berger Bros. Co., Philadelphia, Pa.

SOLDER

Brown Wales Co., Boston, Mass.
Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

SOLDER—ACID CORE

Kester Solder Co., Chicago, Ill.

SOLDER—ROSIN CORE

Kester Solder Co., Chicago, Ill.

SOLDER—SELF-FLUXING

Kester Solder Co., Chicago, Ill.

STARS—HARD IRON CLEANING

Fanner Mfg. Company, Cleveland, Ohio.

STOVE PIPE AND FITTINGS

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

STOVE AND FURNACE TRIMMINGS

Fanner Mfg. Co., Cleveland, Ohio.

STRAINERS—ROOF

Barnes Metal Products Co., Chicago, Ill.

STRAPS—ORNAMENTAL PIPE

Barnes Metal Products Co., Chicago, Ill.

TINPLATE

Berger Bros. Co., Philadelphia, Pa.
Brown Wales Co., Boston, Mass.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.
Republic Steel Corp., Youngstown, Ohio.

TOOLS—TINSMITH'S

(See Machines & Tools—Tinsmith's)

TRIMMINGS, FURNACE

Fanner Mfg. Co., Cleveland, Ohio.

TRIMMINGS, INCINERATOR

Fanner Mfg. Co., Cleveland, Ohio.

UNIT AIR CONDITIONERS

Andes Range & Furnace Corp., Geneva, N. Y.
Forest City Foundries Co., Cleveland, O.
Henry Furnace & Fdry. Co., Cleveland, O.
Health-Air Systems, Ann Arbor, Mich.
Hess Warming & Ventilating Co., Chicago, Ill.
Lakeside Co., Hermansville, Mich.
Lennox Furnace Co., Marshalltown, Iowa.
May-Fiebeger Company, Newark, Ohio.
Meyer Furnace Co., Peoria, Ill.
Motor Wheel Corp., Lansing, Mich.
Payne Furnace & Supply Co., Beverly Hills, Calif.

VACUUM CLEANERS—FURNACE

(See Cleaners—Furnace Vacuum)

VENTILATORS—CEILING

Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, O.
Independent Reg. & Mfg. Co., Cleveland, Ohio.

VENTILATORS—FLOOR

Aeolus Dickinson, Chicago, Ill.

VENTILATORS—ROOF

Aeolus Dickinson, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Jordan & Co., Paul R., Indianapolis, Ind.
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

WELDERS, SPOT

Interstate Machinery Co., Chicago.

WOOD FACES—WARM AIR

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Milwaukee, Canton, Chicago, LaCrosse, Kansas City.

CLASSIFIED ADVERTISING

SITUATIONS OPEN

WANTED—SHEET METAL AND ROOFing estimator and salesman. Must be thoroughly experienced in the industry. Address Key 173, "American Artisan," 1900 Prairie Avenue, Chicago.

WANTED — A-NUMBER-ONE SHEET metal working foreman. Must be capable of doing neat bench work, laying out work and doing outside work. Give reference and state age. Job located in central Illinois. Address Key 162, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

Salesmen

traveling Nebraska, Iowa, Missouri and the Southern States calling on the furnace trade can make good commissions selling our line of blowers and air washers. Ours is a quality line and we can use only quality men. Address Key 165, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SALESMEN — LEADING MANUFACturer with line of cast and steel warm air furnaces, steam and hot water boilers and other heating supplies has territory open in Missouri, Iowa, Ohio and Illinois. Address Key 161, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

SITUATIONS WANTED

SITUATION WANTED—PLUMBER, heating and sheet metal man, wants good position, married. Can go to work at once. Address H. C. Hughes, Forest City, Iowa.

WANTED—JOB BY COMPETENT COMbination plumber and tinner, 16 years' experience, full particulars in future correspondence. Address H. W. Chambers, Shellrock, Iowa.

EXPERIENCED FURNACE SALESMAN would like position representing responsible manufacturer in Wisconsin. Address Key 172, "American Artisan," 1900 Prairie Avenue, Chicago.

WOULD LIKE TO HEAR FROM SOMEone who needs a good reliable radiator man and tinner. Will go anywhere. Address J. D. Jacimore, East Main Street, Russellville, Arkansas.

MARRIED MAN, SOBER AND REliable, who has had twenty years' experience in hardware, can do plumbing, heating and tinning expertly, desires a position with hardware concern in need of an all around man. Can furnish character and qualification references. Address Key 169, "American Artisan," 1900 Prairie Avenue, Chicago.

SITUATION WANTED—BY A GENERAL all-around tinner; small town or city preferred. Years of experience at tinning and furnace work; hardware clerk. Address "Tinner," Route 4, Box 182, Des Moines, Iowa.

SITUATION WANTED — BY SHEET metal mechanic, experienced on general jobbing, gutter and shop repair work—warm air heating also pipe fitting. Address Key 152, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED—GOOD SHEET metal, plumber and furnace man open for good position. Can go to work at once. A1 references. Married. Address Key 144, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

SITUATION WANTED—ALL AROUND sheet metal worker and furnace man. Prefer Wisconsin, Michigan or Illinois. Available immediately. Address Key 167, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

SITUATION WANTED — A-1 SHEET metal worker wishes situation in town or small city. Can handle all classes of tin and sheet metal work. Steady work more essential than wages. Address Metal Worker, 154 Oakland Avenue, Macon, Georgia.

SITUATION WANTED—BY A SHEET metal worker and furnace man. Best references; 38 years old; 22 years' experience. Address V. H. Worrell, 1033 Dawson Street, Waterloo, Iowa.

SITUATION WANTED BY FIRST CLASS sheet metal worker. Would like to connect with some concern doing work all over the country. Sober, steady and reliable and good habits. Will stick to the concern I connect with. Address Key 168, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

SITUATION WANTED—BY A COMPEtent heating man and sheet metal worker; can also do steam work and plumbing. Experienced in gravity and forced air. Can make layouts on either warm air or steam jobs. 25 years' experience; married; strictly sober and can come at once. Address Key 153, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED — BY SHEET metal mechanic, experienced on general jobbing, gutter and shop repair work—warm air heating also pipe fitting. Address Key 152, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED — BY FIRST class sheet metal worker. Can estimate work and lay out patterns. Expert furnace installer. Good salesman. Hardware experience. Best of references. Address Key 155, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

FOR SALE

FOR SALE

One No. 4 Type "H" Wheel, 25" diameter, 4000 C.F.M., 470 R.P.M., Autovent Fan, Direct Connected to a 1 HP 220 Volt, Single Phase, 60 Cycle Induction Lovis-Allis Company Motor. Splendid condition. Original price $355.00. For quick sale, at sacrifice, $200.00. Address key 170, "American Artisan," 1900 Prairie Avenue, Chicago.

FOR SALE—ONE No. 2 RYERSON serpentine shear, Belt Driven. Capacity of cutting 10 ga. material. $125.00. Slightly used. Address E. A. Knabe, Rock Falls, Illinois.

FOR SALE — COMPLETE HARDWARE and sheet metal business in a town of 15,000 in Northern Illinois. Doing all sheet metal and maintenance for several large factories, also the agency of the Timken Silent Automatic Oil Burner and MW hot water heater of which we have a large business built up. A good business for some sheet metal and hardware man who wants to get out of the large city. Address Key 174, "American Artisan," 1900 Prairie Avenue, Chicago.

FOR SALE—OFFICE FIXTURES, INcluding safe, adding machine, cash registers, and Uarco business system, also some tinners' tools. Address Jas. B. Crowley, Oelwein, Iowa.

FOR SALE—RADIATOR AND WELDING shop in one of the best towns of 8,000 population in Arkansas at bargain. Address Key 174, "American Artisan," 1900 Prairie Avenue, Chicago.

AIR-O-VAC FURNACE CLEANER WITH tools. New condition. Cost $350.00. First check for half takes it. Write No. 2101 East Wood Place, Milwaukee, Wis.

BUSINESS CHANCES

ONE-THIRD INTEREST IN GOOD sheet metal and retinning business. Sale forced by death. Address Mrs. C. A. Martin, Bywater & Groo Co., 144 West South Temple, Salt Lake City, Utah.

WANTED — EXPERIENCED MANUFACturer of heating equipment, familiar with accounting and finances, and capable managing large plant. Give complete information. Address Key 164, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

WANTED — TO CORRESPOND WITH party interested in manufacturing, in a modest way, metal tanks, boats and a low priced steel furnace. Address Key 163, "American Artisan," 1900 Prairie Avenue, Chicago, Ill.

LINES TO HANDLE

District Sales Representatives

To salesmen of proven ability we offer a commission proposition in a few attractive territories. Trade paper advertising starts August issues. Write at once for details. Automatic Humidifier Sales Co., 6560 Cass Avenue, Detroit, Michigan.

LINES WANTED

Manufacturers' Agent

acquainted with every large furnace supply house in the territory from the Missouri River on the East to the Pacific Coast on the West can handle several good lines to advantage. Commission basis. In first letter give all information, including territory, prices and commissions. Address Key 166, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

WANTED TO BUY

WANTED—ONE SET OF 40" OR 42" forming rolls. Must be in first class condition and a bargain. Address Key 171, "American Artisan," 1900 Prairie Avenue, Chicago.

WANTED—ONE SET OF TINNERS' tools, prefer a 36" Squaring Shear and 30" folder. Address Peter Sorenson, Hawthorne Avenue, Albert Lea, Minn.

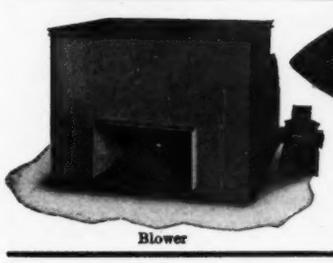
WANTED—USED SUCTION FURNACE cleaner. State make, age, condition and price. Address Trotter Hardware Company, East Liverpool, Ohio.

MISCELLANEOUS

Patents and Trade Marks

Philip V. W. Peck

Barrister Bldg., Washington, D. C.



Blower

Air Conditioning

The Health Air Blower • **A Complete Air Conditioner**

for New or Old Installations

Low Priced ***Write for our Attractive Proposition*** **Efficient**

HEALTH AIR SYSTEMS, 1105 N. Main St., Ann Arbor, Mich.

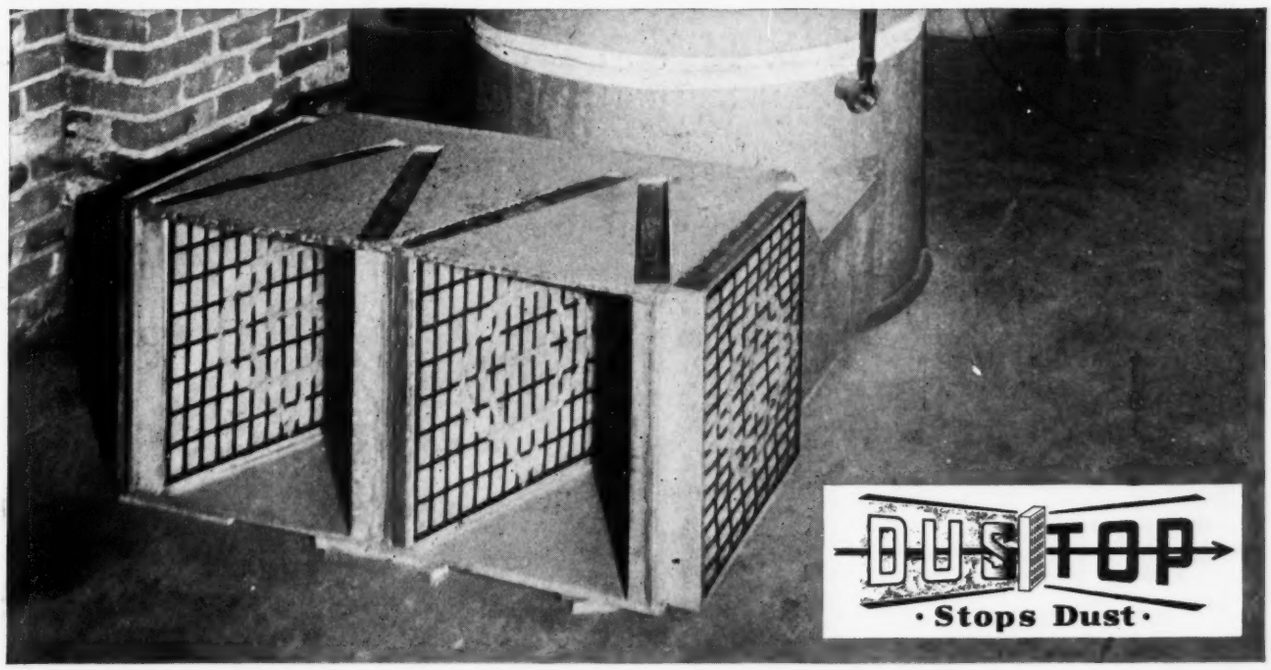
Air Conditioner

Index to Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

August, 1932

8,500,000 PROSPECTS
and profit in every job



A typical installation of DUSTOP filter units on a standard type of warm air furnace.

● Dust and dirt circulating from 8,500,000 furnaces! 8,500,000 gravity warm air furnaces just waiting for aggressive dealers to install gravity filters!

It's your job to make dirty furnaces clean. You can do this job at a profit—with DUSTOP.

DUSTOP retails to the householder at $1.50. This low figure enables you to use as many of them as are necessary to do an effective job.

Dust is one of the gravest concerns of the modern housewife. There's a smooth selling approach for you. Tell housewives that you can stop furnaces from spreading dust and dirt and you'll get into as many basements as the meter man.

DUSTOP filters will live a whole heating season and more. DUSTOP is the only filter that will do a real job of cleaning on low velocities —as low as 25 feet per minute. And average velocities will run around 140 feet per minute on a moderately cold day.

The new DUSTOP glass wool filter offers furnace dealers a fine opportunity to build up a volume of profitable business.

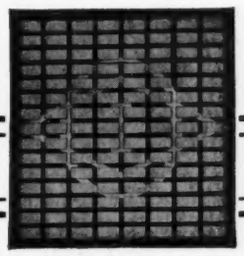
For more detailed information mail the coupon today. You will receive a booklet giving complete information on DUSTOP installation both for gravity furnaces and for the revamping of gravity jobs for mechanical circulation of filtered and heated air. Owens-Illinois Glass Company, Toledo, Ohio.

Owens-Illinois Glass Company (Industrial Materials Division)
Toledo, Ohio
Please send me your booklet "Jobs To Do at a Profit."

*Name*_____

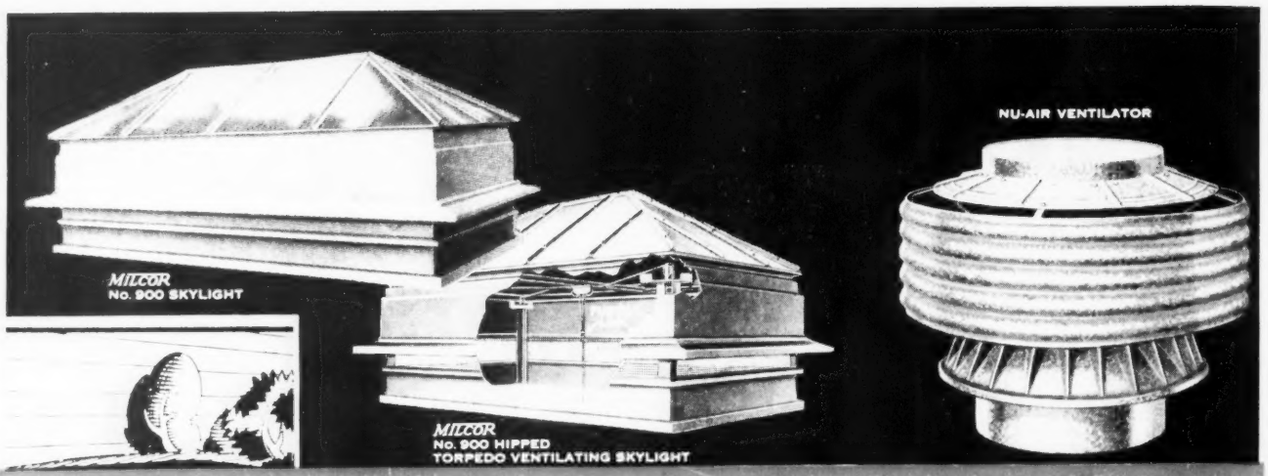
*Address*_____

Furnace filters for gravity and mechanical warm air furnaces



distributed through jobbers and manufacturers everywhere.

OWENS-ILLINOIS AIR FILTERS



MILCOR PRODUCTS

Save with Steel — TONCAN — ARMCO — ANACONDA from mine to consumer — Copper Alloy Steel

FULL MEASURE · · · FULL WEIGHT · · · DEPENDABLE QUALITY

YOU CAN MAKE IT PAY

Everything in the great Milcor sheet metal line was designed primarily so you can use it for your own profit.

Milcor's complete line of furnace pipes and fittings, stove pipes and elbows, rain carrying equipment, metal roofing and ventilators, is yours to command for profit in 1932.

Write us for any help you need.

MILCOR STEEL CO.

MILWAUKEE, WIS., 4117 W. Burnham St. CANTON, OHIO
Chicago, Ill. Kansas City, Mo. La Crosse, Wis.

Sales Offices: New York, 100 E. 42nd Street; Boston, Mass., 136 Federal Street; Atlanta, Ga., 304 Bona Allen Building; Little Rock, Ark., 104 W. Markham Street; Los Angeles, Calif., 7267 Clinton St.